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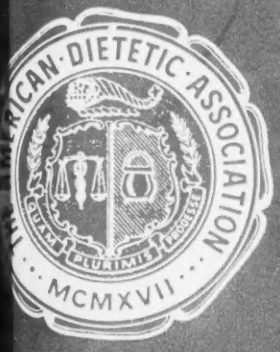

Chemical Additives in Food — *R. Blackwell Smith*

Nursery School Children's Lunch — *Leonora Mirone et al.*

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Drip Losses in Thawing Frozen Poultry — *Elinor R. Larson*

Determining Work Loads — *Maxine Wilson*

Dr. Joseph Goldberger — *Mary Farrar Goldberger*

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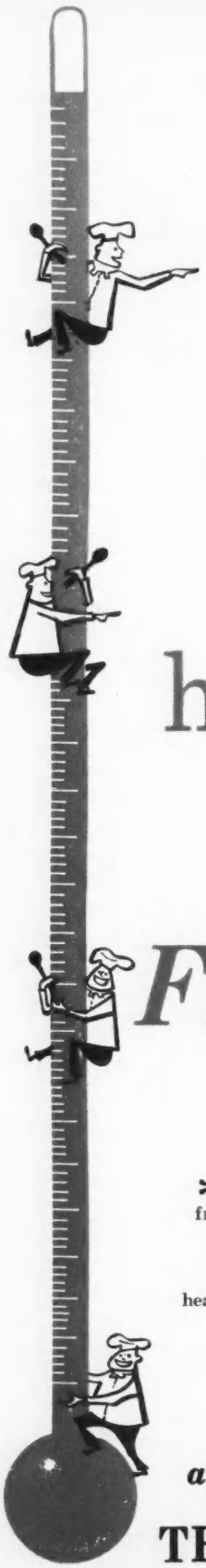

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Chemical Additives in Food[1]

R. BLACKWELL SMITH, JR., Ph.D.

President, Medical College of Virginia, Richmond

SINCE 1950, when the Select Committee to Investigate the Use of Chemicals in Food, of the United States House of Representatives, better known as the Delaney Committee, opened hearings on this subject, so much has been written and said, both in the lay and technical press, that the interested observer has had difficulty in sifting the wheat from the chaff.

Quite unnecessarily, in the view of the author, alarmed apologists for an essential practice—that of adding chemicals to food—have attempted to oversimplify the matter by pointing out the obvious fact that everything we eat is chemical in nature, thus misleading the uninformed and insulting the intelligence of all who know that there are chemicals and chemicals, some utterly harmless and others quite the opposite. At the other extreme there have been those who have taken an equally untenable position and have sought to blame food chemicals for multitudinous human ills. Thus for some time there was more heat than light. Not surprisingly, the true implications of the use of chemical additives in food lie between these two extreme positions.

Chemicals have been added to food for many years for the purposes of providing a more bountiful and more palatable food supply. This twofold objective remains the prime basis for the use of chemical additives. In earlier years when simple and well known chemicals were used by families in preparing and preserving foods for their own use, and even later when food was commercially prepared in relatively small quantities for use within restricted areas, there were no large questions of public welfare involved. However, conditions have changed so that the matter of the safety of food containing chemical additives has become a public health matter of prime importance and the regulation of the use of chemicals in food has raised significant questions of public policy. Some of the conditions contributing to the matter of safety include: the rise of the great food industries preparing food for distribution throughout the nation; the discovery and widespread use of many insecticides for protecting food crops against the ravages of lower forms of life; the discovery by food technologists of new chemicals having functional usefulness in food production, and the introduction into interstate commerce of food bearing such chemicals.

As recently as 1950 there was a notable dearth of agreement among presumably well informed individuals as to the basic principles, considerations, and procedures involved in such fundamental matters as the evaluation of the safety of chemical additives. There was no generally accepted terminology to promote understanding in discussions of food chemicals. There was no organized and competent body of scientists, responsible to neither industry nor government, established for the purpose of disseminating knowledge and promoting understanding of the problems involved in this area. There did exist a plethora of opinions, most of them divergent. Perhaps the most authoritative document in the field was the excellent presentation of procedures for the appraisal of the toxicity of chemicals in foods published by Lehman and his associates in 1949 (1). Happily, much progress has been made since then.

Food Protection Committee

In September, 1950, the Food Protection Committee of the National Research Council held its organizing meeting. This Committee operates under the Food and Nutrition Board, but is independently financed by grants from a broad representation of food and chemical industries and private individuals. These grants are administered by the National Research Council, and the policies of the Council guarantee the independent nature of the Committee's views and publications.

Shortly after the organization of this committee, its objectives were announced as follows:

> I. It will act as a central clearing house for scientific information on pesticides and functional chemicals. II. It will through various subcommittees organize, review and summarize this information in a form which will make it easily available. III. Although the Committee has not proposed to conduct research, it will assist in the integration of research on utilization of chemicals in food production, and will promote additional research, by

[1] Presented at the 38th Annual Meeting of The American Dietetic Association in St. Louis, on October 20, 1955.

existing agencies, which in the Committee's opinion appears most desirable in the public interest. IV. Through its liaison advisory panels consisting of Federal, state and industrial scientists, it will aid industry and regulatory agencies in the formulation of guiding principles and standardized procedures essential to safeguard the food consumer and to meet the requirements of the regulatory agencies concerned. V. It will encourage and aid in the distribution of accurate scientific information to the general public.

In undertaking this assignment, the Committee recognized that the goal of all concerned is the production of food which will promote public health and an efficient national economy.

Principles in Evaluating Additives

Early in its work the Committee attempted to fulfill its objectives of aiding industry and regulatory agencies in formulating guiding principles and standardized procedures essential to safeguard the food consumer and to meet the requirements of the regulatory agencies. In this work the Committee received valuable advice from a liaison panel representing industry, public research and control agencies, and scientific societies. In its published pamphlets, "Use of Chemical Additives in Foods" (2) and "Safe Use of Chemical Additives in Foods" (3), the Committee set forth what it believed to be the basic considerations and principles involved in the use of food chemicals generally and in deciding whether a given chemical should be used as a food additive. An attempt was also made to introduce terminology, the acceptance and use of which would promote understanding.

In its pamphlet, "Principles and Procedures for Evaluating the Safety of Intentional Chemical Additives" (4), the Committee attempted to refine the definition of terms and to broaden the statement of principles published earlier. These principles are believed worthy of detailed mention here. They are:

(1) A decision to use an intentional additive in food should be based on the assurance (a) that it will be safe and (b) that it will benefit the consumer. (2) Results of critically designed tests of the physiologic, pharmacologic and biochemical behavior of a proposed additive made in various species of animals can provide a basis for the evaluation of the safety of a chemical additive at a specified level of intake by man. It is impossible, however, to establish absolute assurance that the additive at this level will be completely safe for all humans under all conditions. (3) Additives should be subject to continuing observation for possible deleterious effects under prolonged and varying conditions of use and should be reappraised whenever indicated by advances in knowledge. (4) The safety of an additive should be appraised in terms of the minimal level of physiologic response, of the extent of its use in foods, and of the amounts that may be eaten under all likely patterns of consumption. No substance should be added to a food if there appears to be a reasonable probability that the maximum amount likely to be consumed in the human diet will produce adverse deviations from normal physiologic function.

This statement of principles as a guide to policy decisions, along with the extension of definitions of terms and a suggested outline of procedures, is intended to provide a reasonable basis for designing a program of tests for evaluating the safety of chemical additives in human foods.

Work on Specific Additives

The Committee has also studied the safety of specific chemical compounds as chemical additives in foods when requested to do so by the Food and Drug Administration. As an outgrowth of such studies, the Committee has published monographs dealing with the safety of mono- and diglycerides (5) and the safety of polyoxyethylene stearates for use as intentional additives in foods (6). Just published, too, is a monograph dealing with the safety of artificial sweeteners (7). In the preparation of these monographs, exhaustive literature searches were made, all available information was gathered from interested industries and from the government, and the data thus obtained were studied in the light of the basic principles and considerations earlier published by the Committee. In response to requests from industry, the Committee now has under study similar projects dealing with surfactants and chelating agents. Studies are also being made of basic principles and procedures involved in the safety of food packaging materials.

In addition to these studies, an annotated bibliography of analytical methods for pesticides has been published. The Food Technology Subcommittee has also conducted an extensive survey to determine, insofar as this is possible, what intentional chemical additives are currently used in food and has prepared a statement on the use of additives in food processing (8). It is believed that the work of the Food Protection Committee has been most valuable in helping to bring about a degree of general agreement in regard to basic principles that did not exist before.

International Considerations

Interest in chemical additives is international in scope, as evidenced by the joint FAO/WHO Conference on this subject held in Geneva, Switzerland, on September 19 to 22, 1955. Dr. Paul E. Johnson, Executive Secretary of the Food Protection Committee, was a member of the United States delegation and has reported the purposes and conclusions of the conference as follows:

The Conference was convened to consider: 1. Whether and to what extent FAO and WHO could coordinate international activity in the general field of food additives. 2. The desirability of assembling an expert committee for the purpose of formulating general principles governing the use of food additives.

The discussions were confined to intentional additives.

General discussions established that there are a number of things the staffs of FAO and WHO might do to help coordinate international activity in the

field. The conference recommended that the following be undertaken: 1. The collection and dissemination of information on legislation concerning additives in the different countries, including information on changes in legislation as they occur. 2. The collection and dissemination of information on physical, chemical, and biological properties of additives; on methods and justification for use; and on reasons for limitation of use, giving priority of consideration to: a. Food colors b. Preservatives, including antimicrobial agents and antioxidants c. Emulsifiers. 3. The aiding of member countries to coordinate research programs in order to get required information concerning food additives without undue overlapping and duplication of effort.

The conference further concluded that a group or groups of experts might advantageously be used by FAO and WHO for a number of tasks. Recommended activities for such a group or groups included: 1. The formulation of general principles governing the use of food additives. 2. The recommendation insofar as possible, of suitable uniform methods for the physical, chemical, and biological examination of additives. (Here again priority of consideration of food colors, preservatives, and emulsifiers was suggested.) 3. Serving FAO and WHO in an advisory capacity on matters concerning their program in the field of food additives.

These recommendations would appear to indicate that many of the considerations recognized as important in this country have also occupied the attention of workers in this field in the other nations represented at the conference.

Legislation

Mention should also be made of the legislation which regulates the use of chemical additives.

The federal Food, Drug and Cosmetic Act of 1938 defined as adulterated, foods bearing or containing any poisonous or deleterious substances, unless such substances were necessary or could not be avoided by good manufacturing practice. If the latter situation obtained, the law permitted the presence of such substances only in amounts prescribed in legally established tolerances. Legal tolerances were to be established only when substantial evidence could be adduced to demonstrate the safety of food bearing or containing in a specified amount the poisonous or deleterious substance in question.

This was the legal situation in 1950 when the Delaney Committee opened public hearings. The mission of this Committee was to determine whether the federal Food, Drug and Cosmetic Act of 1938 was adequate to assure the public safety so far as the use of chemical additives was concerned. The author's view is that the hearings, while attended by much unnecessary publicity of a rather sensational nature, led to a healthy recognition of the fact that the 1938 Act was inadequate in two respects. First, it contained no provision to assure governmental knowledge that a new chemical was about to be introduced into food; and, second, even if the government were notified of the intended introduction of a new chemical into food, there was no way for the regulatory authorities to know whether it was or was not in fact a poisonous or deleterious substance unless adequate toxicologic, chemical, and use data happened to be available.

Thus it was entirely possible for a new chemical to be introduced into food on the basis of inadequate data, and if the chemical happened to be poisonous or deleterious, nothing could be done to remove it from the food supply until long and complicated investigations, possibly requiring two years or more, could supply evidence of its poisonous nature.

An amendment to the federal Food, Drug and Cosmetic Act has now been enacted which corrects this situation so far as pesticides used in agriculture are concerned. It is understood that this amendment has proved workable and has greatly facilitated the establishment of official tolerances for pesticide residues. Still to be enacted is legislation needed to guarantee that all other chemicals proposed for addition to food will be adequately studied and their safety similarly assured prior to their use as chemical additives.

It would be unfortunate if what has been said above were to create the impression that most of the industries concerned have demonstrated that they need strict regulation for the protection of the public health, for the opposite is true. The great majority of those producing or using chemical additives have voluntarily worked very closely with government regulatory authorities and have sought to do everything possible to protect the integrity of the food supply. It may be said, however, that because of the fundamental relationship between food and human welfare and because of the complexity of the factors involved and the judgments required, the use of chemicals in food requires more exacting legal safeguards than are necessary in most other activities. Human nature being what it is, there will always be a few companies who will risk injury to the public for the sake of profit, or being poorly advised will unwittingly expose the public health to danger. Hence, all must be regulated to afford protection against the ignorance or avarice of a few.

In summary and in conclusion, it may be said that the important subject of chemical additives in food has received the closest attention from industry, government, and disinterested scientific bodies. All of these groups continue to work diligently toward the common objective of insuring the production of food which will promote public health and an efficient national economy. I believe that we all have a right to be proud of the progress that is being made.

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(8) Food Protection Committee: The Use of Chemical Additives in Food Processing. Natl. Acad. Sci.–Natl. Research Council Pub. No. 398, 1956.

New Report on Additives

Specific and detailed information on additives used in food has recently been released in the new publication, *The Use of Chemical Additives in Food Processing.* This report is Publication 398 of the National Academy of Sciences–National Research Council, prepared by the Food Protection Committee of the Food and Nutrition Board.

In the first section, a simplified exposition is presented of the reasons for the use of chemical additives in the manufacture of cereal products, processed fruits and vegetables, beverages, dairy products, confections and other sweets, and meat products and fats. The text considers such general classes of additives as nutrient supplements; bleaching agents; buffers, acids, alkalies; flavoring materials; coloring materials; preservatives; stabilizers and thickeners; sequestrants; antioxidants; and surfactants.

The second section is comprised of a list of some 550 chemicals now used as additives in food processing, together with data on foods in which they are used, the levels of use, and standards and regulations pertaining to each one.

BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Mary Hinman Abel—August 8, 1850–January 20, 1938

Even as late as the turn of the century, there were few who were concerned with interpreting the new subject to the general public. One of those was Mary Hinman Abel, who from 1904 to 1913 wrote homemaker's bulletins for the U. S. Department of Agriculture, including such titles as "Sugar Is Food" and "Beans, Peas and Other Legumes as Food."

Mary Hinman was born August 8, 1850, at Montour Falls, New York, the daughter of Dr. George Theodore and Irene Benson Hinman. She obtained her bachelor's degree at Elmira College and then taught school. While teaching English at the high school in LaPorte, Indiana, she met and married John Jacob Abel. He later became an outstanding pharmacologist at Johns Hopkins University Medical School. Dr. Abel and his wife went to Europe for several years and while he studied in the German universities, she studied science in relation to the home and what was being done in Europe to improve and simplify homemaking. In 1888, the Lomb Prize of the American Health Association was offered for the best essay on "sanitary and economic cooking adapted to persons of moderate and small incomes." Mrs. Abel's essay won over sixty-nine other entries.

In 1893 the Abels returned from Europe and Mrs. Abel became acquainted with Ellen H. Richards, working with her on the New England Kitchen project. Mrs. Abel also wrote the "Rumford Kitchen Leaflets" for the World's Fair in Chicago. These were among the earliest efforts to present in popular form the scientific facts of food selection and preparation. In 1900, Mrs. Abel was appointed to the Baltimore Board of Supervisors of City Charities and served for nine years giving special attention to diet in the city institutions. She was active in the Lake Placid Conferences, her special contributions being in the area of household management. When the American Home Economics Association was founded in 1908, she served as council member for the first five years and from 1909 to 1915 was Editor of the *Journal of Home Economics.* She served as Home Economics Director of the Maryland Food Administration in World War I. Her home came first with Mrs. Abel, but her knowledge of foods and good planning and management made it possible for her to do what was far less common then than it is today—to have a happy home and professional work, too. Mrs. Abel had common sense, enthusiasm, alertness, understanding, strength of purpose, and high intellectual ability. She had a daughter who died in infancy in Germany and two sons.

References: Todhunter, E. N.: John J. Abel. J. Am. Dietet. A. 30: 449, 1954; Todhunter, E. N.: Ellen H. Richards. J. Am. Dietet. A. 29: 1215, 1953; Mary Hinman Abel—1850–1938. Obituary Tribute. J. Home Econ. 30: 361, 1938; Bane, J. L., and Chapin, M. R.: Introduction to Home Economics. N. Y.: Houghton Mifflin Co., 1945.—*Contributed by E. Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

Food Intake of Nursery School Children at Noon[1]

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ALTHOUGH there is an abundance of literature available on what to feed pre-school children, how to feed them, and how to discipline them at meal-time, there is a paucity of information on the amounts of individual foods consumed by pre-school children. Accordingly, this investigation was undertaken to determine the quantity of individual foods consumed at the noon meal by nursery school children and the effect of the amounts of milk ingested on the solid food intake.

Experimental Procedure

Children of the University of Georgia Nursery School participated in this study. The total enrollment was twenty-one, twelve girls and nine boys. As shown in Table 1, attendance varied from day to day. The average age for the group was 3 years 10½ months—for the girls, 3 years 10 months, for the boys 3 years 11 months. The study was conducted for fifteen days over a period of five weeks during February and March. Three times a week—Monday, Wednesday, and Thursday—a record was made of the amount of each food consumed by the girls and boys, respectively.

The menus for the duration of the investigation were planned weekly by members of the research team in cooperation with the nursery school director. The lunches consisted of a protein food, two vegetables, or a vegetable and a salad, dessert, milk, and buttered bread. The children generally were served about 1½ Tbsp. protein food, 1 Tbsp. vegetable, fruit, or salad, 1½ Tbsp. dessert, ½ c. milk, and ⅓ slice of toast. Two typical menus were:

Menu 1

Broiled liver	15.3 gm.
Mashed potatoes	17.7 gm.
Carrot-raisin salad	19.0 gm.
Apricots	57.8 gm.
Croutons	4.4 gm.
Milk	120.0 gm.

Menu 2

Beef patties	21.6 gm.
Spinach	16.9 gm.
Pear salad	29.7 gm.
Orange sherbet	74.5 gm.
Croutons	4.8 gm.
Milk	120.0 gm.

Each lunch was planned to include some foods liked by the children. New foods introduced during the study were asparagus, lamb roast, pineapple chunks, prune whip, and mixed vegetables. The meals were prepared in the usual manner by the nursery school cook with the help of a member of the research team. The plates were served in the kitchen and placed on the tables. The children were allowed and encouraged to come to the kitchen for second, third, and fourth servings.

Results and Discussion

In Table 2 is shown an alphabetical listing of the foods and the average daily amounts consumed during the study by the girls and boys, respectively. Worth noting is the average amount of vegetables (asparagus, carrot strips, Lima beans, peas, spinach, turnip greens, and mixed vegetables) consumed—4.9 gm. with a range of 1.9 to 11.3 gm. compared with an average of 18.2 gm. for Irish potatoes and 16.9 gm. for sweet potatoes. Lamb and Ling (1) and Roberts (2) have also reported a universal dislike

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TABLE 1

Number of participants in study

DAY	GIRLS	BOYS	TOTAL
First Week			
Monday	11	7	18
Wednesday	11	8	19
Thursday	11	8	19
Second Week			
Monday	9	8	17
Wednesday	8	8	16
Thursday	9	9	18
Third Week			
Monday	8	9	17
Wednesday	8	8	16
Thursday	8	8	16
Fourth Week			
Monday	9	9	18
Wednesday	11	8	19
Thursday	10	9	19
Fifth Week			
Monday	10	7	17
Wednesday	9	8	17
Thursday	11	8	19

of vegetables by the pre-school child, all of which indicates the need for stressing the role of vegetables in good nutrition and early formation of good food habits through educational programs for parents. Except for Irish and sweet potatoes, the waste in vegetables was high.

Consumption of fruits and fruit salads, such as applesauce, apricots, pineapple, prunes, peach salad, and pear salad, ranged from 23.1 to 44.3 gm., with an average of 32.6 gm. Fruits were better liked than vegetables. Although fruits should not replace vegetables, they do provide some of the same essential nutrients found in vegetables.

It was of interest to note that the average amount of croutons (made from enriched white bread) eaten was 4.3 gm. compared with 9.5 gm. for whole wheat biscuits. The average consumption of beef, ham, lamb, and liver was 18.0, 14.9, 10.6, and 6.6 gm., respectively. Liver was the least liked of the meats served. Since it is an excellent source of minerals and vitamins, greater consumption of liver in forms pleasing to the children should be encouraged whenever possible.

Larger amounts of salmon were ingested than tuna fish. However, in both instances, the method of preparation appeared to play a role in the amount consumed; for instance, the average consumption was 20.6 and 3.0 gm. for salmon casserole and salmon loaf, respectively, and 11.9 and 3.7 gm. for tuna fish croquettes and tuna fish fondue, respectively.

TABLE 2

Foods and amounts consumed

FOOD	TIMES SERVED	AVERAGE INTAKE	
		Girls	Boys
		gm.	gm.
Applesauce	1	34.4	23.1
Apricots	1	38.7	43.7
Asparagus	1	2.6	4.3
Bacon	1	7.3	5.9
Banana, slices	2	52.2	80.4
Beef (ground)			
Balls	1	18.9	15.4
Loaf	2	24.4	15.8
Patties	1	15.2	18.5
Biscuit, whole wheat	5	9.4	9.5
Cakes, cup	1	44.3	51.5
Carrots, strips	1	6.4	3.6
Cheese, fondue	1	8.8	15.2
Cookies, oatmeal	1	16.5	23.5
Croutons	10	4.7	3.9
Custard, vanilla	1	47.5	118.8
Eggs, creamed on toast cubes	1	28.9	23.4
Fruit cocktail	2	96.1	114.1
Gingerbread with whipped cream	1	21.2	29.8
Ham, baked	2	16.8	12.9
Jello, lime	1	65.4	70.8
Lamb, roast	1	11.8	9.3
Lima beans	1	1.9	6.3
Liver, broiled	1	7.8	5.3
Milk	15	102.3	88.1
Peas, English	2	7.0	11.3
Pineapple, chunks	1	29.7	39.8
Potatoes, Irish			
Diced	1	12.1	14.0
Mashed	2	15.5	12.4
Scalloped	1	19.0	17.7
Stuffed	1	28.9	25.6
Potatoes, sweet			
Baked	1	15.8	12.7
Mashed with raisins	1	27.7	11.3
Prunes			
Stewed	1	28.5	28.3
Whip	1	69.0	87.9
Pudding			
Chocolate	1	58.4	105.5
Vanilla	1	51.9	45.5
Rice and gravy	1	11.5	10.1
Salad			
Carrot and raisin	1	3.9	7.1
Peach	2	44.3	32.9
Pear	2	27.2	21.1
Waldorf	2	7.8	8.7
Salmon			
Casserole	1	18.6	22.6
Loaf	1	6.3	9.7
Sherbet, orange	1	78.2	104.2
Spinach, buttered	3	3.8	3.0
Tomato, sliced	2	13.3	6.6
Tuna fish			
Croquettes	1	11.9	11.9
Fondue	1	1.2	6.2
Turnip greens	2	5.7	3.1
Vegetables, mixed	2	3.9	5.7

The children liked vegetables least and desserts best of the foods served.

In accordance with the observation that at the age of three and four desserts and sweets are preferred, the children ate larger amounts of desserts compared with other food groups. Waste in desserts was practically nil.

Milk was the only beverage served, and average milk consumption during the noon meal was 95.2 gm. or about 80 per cent of ½ c. Unless larger quantities are consumed at the other meals or at some time during the day, these children would not receive the daily recommended amount of 1½ pt.

In Table 3 is shown the average daily milk, solid food, and total food intake for the boys and girls during the noon meal. Analysis of variance disclosed no significant difference in the total food intake for the boys and the girls. Neither the day of the week nor the week order had significant effects on the noon meal food intake.

Correlations and regressions were calculated for total milk and solid food consumed by weeks and by days of week for each sex. The correlation between milk and solids consumed was highly significant for the girls (r = −0.83**). The regression, for girls, using milk consumption as the independent variable was −0.73. The correlation for the boys was not significant (r = 0.02).

TABLE 3

Average daily noon-meal consumption

DAY	GIRLS			BOYS		
	Milk	Solid food	Total intake	Milk	Solid food	Total intake
	First Week					
	gm.	*gm.*	*gm.*	*gm.*	*gm.*	*gm.*
Monday	82.0	112.8	194.8	78.9	107.4	186.3
Wednesday	77.9	117.9	195.8	111.2	159.4	270.6
Thursday	77.7	63.1	140.8	76.2	67.8	144.0
	Second Week					
Monday	118.4	130.4	248.8	111.8	140.0	251.8
Wednesday	145.6	81.5	227.1	106.5	105.8	212.3
Thursday	74.1	92.1	166.2	95.0	157.0	252.0
	Third Week					
Monday	84.6	162.3	246.9	71.5	176.8	248.3
Wednesday	88.1	155.6	243.7	100.8	173.1	273.9
Thursday	57.6	112.4	170.0	45.6	144.5	190.1
	Fourth Week					
Monday	100.4	88.3	188.7	71.6	76.2	147.8
Wednesday	82.3	98.7	181.0	111.1	86.1	197.2
Thursday	161.8	105.7	267.5	111.4	87.4	198.8
	Fifth Week					
Monday	167.0	68.2	235.2	94.0	72.0	166.0
Wednesday	111.7	78.0	189.7	86.6	105.8	192.4
Thursday	104.9	115.9	220.8	50.0	112.0	162.0
	Five-Week Average					
—	102.3	105.5	207.8	88.1	118.1	206.2

Summary

The quantity of foods consumed at the noon meal by pre-school children, 3 years 10½ months of age, is discussed. With the exception of Irish and sweet potatoes, vegetables were consumed in the least amounts and desserts in the largest amounts. About one-third as much liver was consumed as beef. The girls drank 102.3 gm. milk as compared with 88.2 gm. for the boys.

Sex, day of week, and week order had no significant effect on the quantity of food ingested during the noon meal. The correlations and regressions for milk and solid food intake were highly significant for the girls, and not significant for the boys.

REFERENCES

(1) Lamb, M. W., and Ling, B.-C.: An analysis of food consumption and preferences of nursery school children. Child Develop. 17: 187, 1946.

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The Food Market—Then and Now

In 1928, the average grocer stocked 867 items; in 1955, the average number was 4723. Twenty-five years ago, the average canned fruit item competed with 23 others; today it competes with 139 others. Twenty years ago, there were 16 cereals; now there are 91. Frozen foods have added 149 new items.—*Advertising Age, May 14, 1956, p. 90.*

In the last ten years, frozen foods production had quadrupled from 979 million lb. to 4 billion lb. More than half of the families in the U. S. bought frozen foods during an average month in 1955; 35 per cent bought frozen vegetables, 31 per cent frozen juices, and 15 per cent frozen meat pies or prepared dinners.—*Food Field Reporter, May 15, 1956, p. 14.*

Instability of Meringued Pies[1]

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ONE OF the goals of food service establishments is the service of attractive and eye-appealing food. Meringued pies can be an aid or a detriment to this goal. When proper preparation procedures are followed, a delicately browned, fluffy meringue on top of a tender filling in a crisp crust is very appetizing. However, if special precautions are not taken, liquid may seep from between the filling and the meringue, the meringue may slip from the filling onto the plate, and the crust may be soaked.

It has been suggested that the liquid which forms when a cream pie is baked may come from either the meringue (1–3) or the filling (4, 5). Perhaps it is a combination of both. The liquid has been thought by some workers to be due to undercoagulation of the egg white (3). Other investigators (1, 4) felt that the liquid resulted from overcoagulation of the egg protein. The formation of the liquid has been given as one cause when the meringue slips from the pie filling (2, 5).

Bakers often try to decrease the amount of liquid formed on their cream pies by using a stabilizer in the meringue. Studies made with gelatinized cornstarch, agar agar, pectin, and locust bean gum added to meringues have shown that the liquid draining from an unbaked meringue can be considerably reduced (6). Several types of commercial stabilizers which may be used to control leakage of meringues are available on the market.

When a stabilizer is not used, the liquid may be reduced by adding part of the sugar in the form of a hot sirup (2, 7). The addition of water increases the yield of meringue from a given amount of egg white and thus reduces the raw food cost.

It was the purpose of this study to investigate some of the factors affecting the formation of the liquid between the filling and the meringue, and to see if there was a relationship between the formation of the liquid and the slippage of the meringue from the pie.

A preliminary study was conducted to test the equipment developed for recording the interface temperature, measuring the angle of slippage, and collecting the liquid (8).

Experimental Procedure

The present study was planned to test the effect on the amount of liquid collected from the pies and on the slippage of the meringues of the following: (a) a hot or cold sirup with and without a stabilizer in the meringues, (b) temperature of the fillings when meringue was added, (c) baking temperature, and (d) color to which the meringues were baked.

The experimental plan is shown in Table 1. Twenty-four batches of six pies each were prepared.

The temperature of the interface between the me-

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TABLE 1

*Plan of experiment and order of preparation of batches**

FILLING TEMPERATURE	BATCH NUMBER*											
	Light brown meringue				Medium brown meringue				Dark brown meringue			
	Hot sirup used		Cold sirup used		Hot sirup used		Cold sirup used		Hot sirup used		Cold sirup used	
	With stabilizer	Without stabilizer	With stabilizer	Without stabilizer	With stabilizer	Without stabilizer	With stabilizer	Without stabilizer	With stabilizer	Without stabilizer	With stabilizer	Without stabilizer
°C.												
70	14	16	9	10	1	3	2	6	18	20	17	22
50	15	11	12	13	7	4	8	5	24	19	21	23
30	14	16	9	10	1	3	2	6	18	20	17	22
10	15	11	12	13	7	4	8	5	24	19	21	23

* The same pattern was repeated for three oven temperatures: 325°F.; 375°F.; and 425°F.

Gilman photo

Angle of slippage of pie being tested on tilting table designed for this experiment.

ringue and filling, the amount of liquid collected from the pies, and the angle of slippage of the meringues were measured.

A supplementary study was made to compare the amounts of liquid collected from pies baked to different interface temperatures.

The formulas and method of preparation of the fillings and meringues are given on page 713.

The fillings were poured into round cake pans and cooled at room temperature or in an ice bath to 70°C. (158°F.), 50°C. (122°F.), 30°C. (86°F.), and 10°C. (50°F.).

No crusts were used in the preparation of "pies" to eliminate variation in the amount of liquid absorbed by the crusts. When the fillings had cooled to the proper temperature, collars were fitted into the cake pans. The meringue mixture was placed on the filling and leveled with a spatula to the top of the collar. Thus, the meringues were approximately ¾ in. thick. Each collar was fitted with a thermocouple so that the tip of the thermocouple rested in the center of the interface between the filling and the meringue. A recording potentiometer was used to measure the temperature. The maximum interface temperature was used in calculating corrrelations.

Pies were baked at 325°F., 375°F., and 425°F. Since the oven cycles varied greatly, it was, therefore, decided to use the color of the meringue, rather than a definite baking time, as the end point of the baking period. Baking times were recorded and are given in Table 2. Meringues were baked until they matched a specified color plate of Ridgway (9). Plate *XV, 15′ Y–O f* was used as a standard for the "light" meringues; plate *XV, 15′ Y–O b* was used for the "medium" meringues; and plate *XV, 17′ 0–Y i* was used for the "dark" meringues. The meringued pies were set aside to cool for 4 hr.

The cooled pies were placed on a platform (8) which could be tilted mechanically. The angle at which the meringues slipped from the fillings was read and called the "slippage angle." When the meringues slipped from the fillings, they were caught on a screen. The liquid that passed through the screen was collected in a can and was weighed. If the meringues failed to slip or slipped at an angle less than 50°, the pies were tilted at an angle of 50° before the liquid was collected.

TABLE 2

Ranges of baking times for pies

OVEN TEMPERATURE	BAKING TIMES		
	Light brown meringue	Medium brown meringue	Dark brown meringue
°F.	*min.*	*min.*	*min.*
325	6 –13	14–24	43 –53
375	3½– 8	6–17½	6 –25
425	3 – 6½	4– 8	6½–12

Results

LIQUID DRAINED FROM PIES

The weights of the liquid collected are presented in Table 3 and the analysis of variance in Table 4.

Significantly less liquid was collected from pies that were made with meringues prepared with hot sirup than with meringues prepared with cold sirup.

The presence of stabilizer in the meringues greatly decreased the amount of liquid, except for the pies with meringues made with cold sirup and baked to a dark color.

The temperature of the fillings when the pies were meringued was correlated with the amount of liquid ($r = -0.52^{**}$). When meringues were placed on 70°C. (158°F.) fillings, practically no liquid was collected. As the temperature of the fillings was decreased before the pies were meringued, the liquid increased.

Mean values for the amount of liquid collected from pies baked at three baking temperatures and three colors of meringue are shown in Table 5. Neither the color to which the meringues were baked nor the baking temperature had a direct effect on the liquid collected. Both had an indirect effect in that they were factors determining the temperature of the interface.

INSTABILITY OF MERINGUES

The angles of slippage of the meringues are given in Table 3. As the amount of liquid increased, the meringues slipped at a lower angle ($r = 0.51^{**}$). When little or no liquid was present, the meringues did not slide from the fillings.

The correlation between the angle of slippage and the temperature of the filling when meringued was highly significant ($r = 0.87^{**}$). The highest angle of slippage was found when the meringues were placed on fillings at 70°C. and the lowest angle when the meringues were placed on fillings at 10°C.

TABLE 3

Liquid collected, angle at which meringue slipped, and maximum interface temperature of baked pies

OVEN TEMPERATURE	FILLING TEMPERATURE	LIGHT BROWN MERINGUE				MEDIUM BROWN MERINGUE				DARK BROWN MERINGUE			
		Hot sirup used		Cold sirup used		Hot sirup used		Cold sirup used		Hot sirup used		Cold sirup used	
		With stabilizer	Without stabilizer	With stabilizer	Without stabilizer	With stabilizer	Without stabilizer	With stabilizer	Without stabilizer	With stabilizer	Without stabilizer	With stabilizer	Without stabilizer
Liquid Collected													
°F.	°C.	gm.	gm.	gm.	gm.	gm.	gm.	gm.	gm.	gm.	gm.	gm.	gm.
325	70	0	27	0	14	0	18	0	9	0	0	0	0
	50	6	25	26	35	0	39	0	22	0	3	0	6
	30	5	30	26	68	11	27	31	49	17	47	37	43
	10	5	23	48	39	18	31	45	39	27	45	45	28
375	70	0	20	1	16	0	20	2	25	0	15	0	19
	50	2	34	15	31	4	29	3	41	0	22	2	36
	30	6	26	44	35	10	33	30	56	17	33	44	30
	10	5	21	31	37	5	21	43	36	19	34	38	57
425	70	7	17	10	29	0	28	2	20	0	14	0	12
	50	5	22	29	43	7	29	12	30	6	36	16	41
	30	10	33	43	38	14	26	27	59	12	41	39	30
	10	5	29	31	54	9	24	45	41	9	23	31	27
Angle at Which Meringue Slipped*													
325	70	50+	50+	50+	50+	50+	50+	50+	50+	50+	50+	50+	50+
	50	29	50+	18	50	50+	47	50+	50+	50+	50+	50+	50+
	30	21	40	15	16	17	37	13	32	26	36	25	32
	10	20	21	9	22	17	18	13	27	13	—	14	23
375	70	50+	50+	50+	50+	50+	50+	50+	50+	50+	50+	50+	50+
	50	30	30	22	32	44	37	41	44	50+	44	50+	50+
	30	20	25	16	27	20	28	11	16	16	29	10	30
	10	16	21	11	12	17	18	12	16	13	—	12	18
425	70	50+	50+	50+	50+	50+	50+	50+	50+	50+	50+	50+	50+
	50	25	29	21	41	35	34	26	38	32	43	34	42
	30	21	26	15	30	21	50+	17	16	16	18	13	30
	10	21	27	13	9	15	21	9	15	16	24	12	23
Maximum Interface Temperature†													
325	70	159	151	157	162	162	166	160	164	192	186	185	191
	50	145	144	135	131	162	153	160	157	187	176	178	176
	30	104	104	113	108	129	125	123	129	148	141	150	140
	10	98	(93)	(90)	(83)	110	(99)	103	(103)	140	135	137	122
375	70	169	154	161	171	163	172	161	155	182	168	188	169
	50	141	140	147	126	148	151	144	148	171	154	155	150
	30	97	101	102	96	120	109	115	114	118	112	109	115
	10	117	(85)	102	(86)	(95)	(96)	(95)	(89)	109	110	108	115
425	70	147	176	156	170	180	156	167	161	179	173	186	193
	50	145	129	154	130	142	148	136	135	183	146	146	151
	30	99	110	110	104	107	115	111	106	109	109	120	111
	10	95	(85)	(80)	85	(89)	(93)	(85)	88	(96)	90	105	(87)

* The lower the angle, the sooner the meringue slipped from the pie when tilted. 50+ denotes that meringue did not slip at the angle of 50°, the highest angle measured.

† The interface temperatures given in parenthesis are maximum temperatures; temperatures of these pies were lower immediately after baking, but rose to room temperature as the pies stood 4 hr.

Formulas and Procedures for Making Six-Pie Batches of Vanilla Cream Pie Filling and Meringue

Vanilla Cream Pie

Water	6 qt.
Dry milk solids	1 lb. 8 oz.
Sugar granulated	2 lb. 11 oz.
Flour, pastry*	1 lb.
Voltex†	1 lb. 1 oz.
Margarine	6 oz.
Salt	½ oz.
Vanilla	¼ cup

PROCEDURE: Heat 4 qt. water to boiling in a steam-jacketed kettle. Blend thoroughly 2 qt. water, dry milk solids, sugar, flour, and VolTex. Beat blended ingredients into boiling water with a wire whip. Stir filling carefully to prevent sticking. Cook until the raw flavor of starch has disappeared. Turn off steam and blend margarine, salt, and vanilla into the filling.

Meringue

Sugar, granulated (Part I)	4 oz.
Stabilizer‡	¾ oz.
Water	1½ cups
Egg white (10°C.)§	1 lb.
Sugar, granulated (Part II)	1 lb. 8 oz.

PROCEDURE: Blend Part I of sugar with stabilizer, if used. Add to the water and bring to a boil. Use sirup immediately for "hot" sirup method. For "cold" sirup method, cool to 10°C. (50°F). Beat egg white with a wire whip on medium speed of an electric mixer. Gradually add Part II of the sugar after 30 seconds of beating. After 8½ min. beating, add sirup slowly to the whites. Total beating time should be 20 min.

* Milled from soft wheat flour grown in New York State.
† Frozen egg yolk and egg white, salt, and a stabilizing sirup (dextrose, dextrin, maltose, and water).
‡ Vegetable gum, salt, starch, and citric acid.
§ Frozen egg white containing sodium phosphate and triethyl citrate.

INTERFACE TEMPERATURE

Interface temperatures of the pies are given in Table 3. The amount of liquid collected was related to the temperature of the interface between the filling and meringue. In pies with meringues prepared with cold sirup, a gradual decrease in the amount of liquid occurred with increasing interface temperatures ($r = -0.74^{**}$). Meringues prepared with hot sirup tended to have more liquid as the interface temperature increased up to 140°F. (60°C.). At temperatures above 160°F. (71°C.), the liquid decreased greatly. The linear correlation coefficient for pies with meringue made with hot sirup was -0.35^{**} but is probably not very meaningful because of the sharp break in the line. In spite of this, the correlation coefficient for all pies was highly significant ($r = -0.54^{**}$).

The angle of slippage was positively correlated with the temperature of the interface ($r = 0.83^{**}$), indicating that as this temperature increased, the meringue slipped less readily (higher angle of slippage). A highly significant correlation ($r = 0.88^{**}$) was found between temperature of the filling when meringued and interface temperature. The highest interface temperatures were reached when meringues were added to hot fillings; lowest interface temperatures were reached when meringues were placed in cold fillings. Baking temperature and color to which the meringue was baked also affected the tempera-

TABLE 4

Mean squares for amounts of liquid collected from pies

SOURCE OF VARIATION	DEGREES OF FREEDOM	MEAN SQUARE		
		Light brown meringue	Medium brown meringue	Dark brown meringue
Sirup temperature	1	3008**	1452**	540**
Stabilizer	1	3104**	3924**	1669**
Sirup temperature × stabilizer	1	281	75	346*
Filling temperature	3	797**	1177**	2225**
Sirup temperature × filling temperature	3	416**	547**	72
Stabilizer × filling temperature	3	15	281**	93
Sirup temperature × stabilizer × filling temperature	3	17	105**	189*
Baking temperature	2	106	18	73
Sirup temperature × baking temperature	2	47	68*	68
Stabilizer × baking temperature	2	14	20	113
Sirup temperature × stabilizer × baking temperature	2	23	26	53
Filling temperature × baking temperature	6	9	34	273**
Error	18	79	19	47

* Significant. $0.01 \leq P \leq 0.05$.
** Highly significant. $P \leq 0.01$.

TABLE 5

Mean values of liquid collected from pies

FILLING TEMPERATURE	AVERAGE LIQUID COLLECTED			
	Hot sirup used		Cold sirup used	
	With stabilizer	Without stabilizer	With stabilizer	Without stabilizer
°C.	gm.	gm.	gm.	gm.
70	1	18	2	16
50	3	27	11	32
30	11	33	36	45
10	11	28	40	40

ture of the interface. The highest interface temperatures were reached when pies were baked at 325°F. and 425°F. The darker the meringues became, the higher the interface temperatures were.

It would, therefore, be possible under actual kitchen conditions to control the temperature of the interface by adjusting the temperature of the filling when meringued, the baking temperature, and the color of the baked meringue.

Discussion

EFFECT OF TEMPERATURE OF SIRUP

Meringues prepared with a cold sirup yielded considerably more liquid than those prepared with a hot sirup.

With cold sirup, the liquid decreased with increasing interface temperatures. This findings supports the theory of Hester and Personius (3) that baking procedures are needed which raise the interface temperature high enough and long enough for coagulation of the egg white proteins to take place.

When the meringues were prepared with hot sirup, with and without stabilizer, liquid increased with increase in interface temperatures up to 140° to 160°F. (60° to 71°C.), indicating that liquid formation may be due to overcoagulation of the egg white in these meringues (6). The temperature of some of the meringues immediately after the addition of the hot sirup was approximately 65°C. (149°F.). The meringues, therefore, were partially cooked before they were placed on the fillings. Additional cooking may have occurred during baking, thus reducing stability of the meringues as the temperature increased. At interface temperatures above 160°F. (71°C.), the amount of liquid decreased.

In a supplementary study, a meringue made with hot sirup and no stabilizer was divided between six cream pie fillings. The temperature of the fillings was 50°C. (122°F.) when meringue was added. The pies were baked at 325°F. and removed from the oven at interface temperatures between 140°F. (60°C.) and 190°F. (88°C.) at intervals of 10°F. The experiment was repeated, removing the pies from the oven at interface temperatures between 125°F. (52°C.) and 175°F. (80°C.). Liquid increased with the interface temperature up to 160°F. and then dropped sharply (*Fig.* 1). Evidently, the liquid

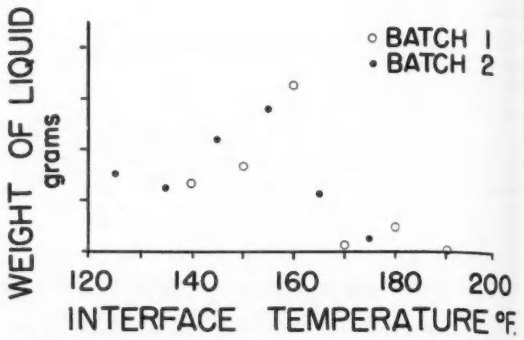

Fig. 1. Relationship between amount of liquid collected from pies and maximum interface temperature (supplementary study).

present at the low interface temperatures disappeared with prolonged baking. The fillings of the pies baked to interface temperatures above 165°F. were curdled and slightly darker than those of pies with interface temperatures below 160°F.

EFFECT OF STABILIZER

The use of a vegetable gum stabilizer in the meringues decreased the amount of liquid collected from the pies. The effect of various types of stabilizers is now being studied.

EFFECT OF FILLING TEMPERATURE

Practically no liquid was drained from pies which were meringued when the fillings were 70°C. As the fillings were cooled to lower temperatures before meringue was added, increasing amounts of liquid were collected.

Meringues slipped less on fillings at 70°C. when meringued than at 10°C. This may have been due partly to the effect of the amount of liquid on the angle of slippage and partly to the smoothness of the surface of the fillings. The surfaces of the fillings meringued while hot became wrinkled as the meringues were applied. When this occurred, the meringues were probably prevented from slipping because of the ridges. As the temperature of the fillings decreased, the surface appeared smoother and more resistant to deformation as the meringues were applied. The 10°C. fillings had rigid and very smooth surfaces. When the surface was very smooth, there was nothing to hinder the meringue from sliding, regardless of the amount of liquid present.

EFFECT OF BAKING TEMPERATURE

Pies baked at 325°F. required much longer to reach a specified meringue color than those baked at the higher temperatures. In many instances, the interface temperature was higher when the pies were baked at 325°F. than at the higher temperatures. Also, the interface temperature remained high longer and the pies cooled more slowly than when baked at the higher temperatures.

Meringues of pies baked at 425°F. reached the desired color in a relatively short time and the interface temperatures were relatively high. However, the pies cooled rapidly and the interface temperatures remained high for only a short time.

Pies baked at 375°F. seemed to yield comparatively little liquid. A moderate interface temperature was reached in the moderate length of time. Perhaps the "cold sirup" meringues became partially coagulated, whereas the "hot sirup" meringues did not reach the overcoagulated stage.

EFFECT OF COLOR

The final color of the meringues affected the interface temperature of the pies. At each baking temperature, the darker the meringue, the higher was the interface temperature because of the longer baking time.

Summary

A study was made of some of the factors affecting leakage and slippage of meringues of cream pies. Variables were: formula and preparation procedure of meringue, temperature of filling when meringued, baking temperature, and color to which the meringue was baked. The weight of the liquid drained from the pies and the angle at which meringues slipped were measured objectively. The temperature of the interface between the filling and meringue was measured with a recording potentiometer.

When a cold sugar sirup was used in the meringue, the amount of liquid drained from finished pies decreased as the interface temperature increased. When a hot sugar sirup was used, the liquid increased as the interface temperature increased up to about 160°F. (71°C.) and then the amount of liquid dropped sharply; the fillings of most of these latter pies were curdled and unappetizing.

In general, the slippage of the meringues increased as the amount of liquid increased. The angles of slippage of the meringues were also correlated with temperatures of the fillings when meringue was added. As the filling temperature decreased, the meringues became more slippery. This may have been due to the greater amount of liquid collected from pies or the smoother surface of the filling.

Preparation procedures for baking meringued pies used in this study which led to the most stable meringues were: using a hot sirup and vegetable gum stabilizer in the meringues; meringuing the fillings while they were still hot; and baking pies at 375°F. until the meringues reached a light color.

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Sizes of "Average" Servings

How much is one "serving" of a food? This question was the topic of a joint research project at the agricultural experiment stations of Iowa, Michigan, Minnesota, Nebraska, South Dakota, and Wisconsin. Findings have been published in *Weights of Foods Eaten Per Meal*—North Central Regional Publication 37—in which a compilation of recommended "average servings is reported. Some of these figures are:

Bacon	½ oz.
Bananas	2¾ oz.
Bread (about 1½ slices)	1¼ oz.
Butter	½ Tbsp.
Cream	
In coffee	½ oz.
(Or milk) on cereal	⅓ c.
Milk (for drinking)	1 c.
Pears	4 oz.
Sugar (in coffee or on cereal)	2 tsp. (scant)
Vegetables	
Carrots (raw)	1 oz.
Cauliflower, peas, parsnips, corn, and spinach	2½ oz.
Potatoes (depending on method of preparation)	2¼ to 4¼ oz.
Tomatoes	3¾ oz.

Vitamin Losses in the Drip from Thawed, Frozen Poultry[1]

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Montana State University, Missoula

SEVERAL decades ago consumption of poultry was seasonal. Today, because of promotion, improved marketing methods, and freezing, poultry is consumed the year round. In 1930 we had 10 million lb. turkey in frozen storage; in 1950, 127 million lb. (1). This increase has been typical not only for turkeys, but to some degree for all kinds of market poultry. Consequently, there is need for knowledge regarding the effects of freezing on nutrients in poultry.

When poultry is allowed to thaw before cooking, a blood-like fluid exudes from the flesh. Does this fluid contain nutrients? A study made by Kotschevar (2, 3) on the nutritive values of drip lost through thawing muscle and glandular meats indicated that about the same amount or slightly more thiamine and niacin and about the same amount of riboflavin was in the drip as in the drip source before freezing. He also hypothesized that thiamine was labile to thawing. If this is true of muscle and glandular meats, would it not also hold true of poultry?

Kotschevar also found that the quantity of drip varied with the animal specie and that glandular meats excreted more drip than muscle meats. The ratio of bone and fat to lean meat was another factor, as was the ratio of cut surface to volume of meat. The cut or type of meat formed a fifth determinant in the drip loss (2, 3).

Nichols and MacKintosh (4) found that both intra- and inter-cellular ice crystal formation contributed to the fragmentation of muscle fibers and, as the number of these broken fibers increased, drip increased.

Prior to Kotschevar's work, only two earlier studies dealt with the nutritive value of drip. Pearson *et al.* (5) tested paired steaks and found that approximately 10 per cent of the B vitamins were lost by drip. Cook *et al.* (6) reported that the drip of thawing beef contained about 9 per cent protein. So far as can be ascertained, no work previous to this study has dealt with poultry drip.

Procedures

Four frozen, eviscerated, cut-up chickens were used in each test, with each test being replicated three times. For turkeys, two frozen, eviscerated, pan-ready birds were used for each test, which was replicated twice.

Species of lactic acid bacteria which are specific in their nutritional needs to the individual B vitamins were used to determine the quantity of B vitamins in the drip. Such microbiologic methods have proved their accuracy in comparative tests with rats and chickens (7) and with chemical methods.

Thiamine was tested by using *L. fermenti 36* according to the method described by Johnson (8). Riboflavin was determined by using *L. plantarum (arabinosus)*, and niacin by using *L. casei Be-I* according to methods outlined in *Methods of Vitamin Assay* (9). Each week new stab cultures were prepared. After the second week, cultures were transferred from the most recent stabs rather than from the purchased stock cultures.[2]

Frozen poultry was purchased from a local wholesale purveyor who furnished a storage history from time of packing to laboratory delivery. Chickens cut for frying at the time of freezing had been placed in waxed cardboard boxes sealed in an outer coating of waxed paper. The storage period was approximately eight months. Weight was listed on each package as 2 lb. 8 oz. Turkeys had been eviscerated and stored in polyethylene wraps for approximately the same length of time. They varied in weight from 19 lb. 2 oz. to 21 lb.

For each test, the chickens were unwrapped, weighed, and placed in large glass funnels. The funnels were then covered with polyethylene wraps secured around the funnel base to prevent evaporation loss during thawing. Each funnel was placed in

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[2] All bacteria were purchased from George Washington University, Washington, D. C. Culture broths, basal mediums, and inoculum broths were purchased from Difco Laboratories, Inc., Detroit.

lettered, tared, colored Erlenmeyer flasks to collect drip and prevent evaporation loss. The chickens remained at room temperature 4 hr. Then they were placed in a refrigerator set at 0°C. for 16 hr. longer. At the end of the initial 2-hr. period, chickens were broken apart to facilitate thawing, care being taken to avoid drip loss. Turkeys were weighed, placed in stainless steel pans, and thawed 4 hr. at room temperature. Thawing was completed under refrigeration during an additional period of 48 hr.

In calculating the percentage of drip, the weight of the poultry as it came from the package was used as 100 per cent. The drip collected in each flask was weighed. Two 5-ml. samples of drip were weighed in tared watch glasses, then dried in a desiccating oven to determine the percentage of solids. Only two samples of drip in each test were calculated for percentage of solids. The two samples for chickens were selected at random.

All vitamin determinations were obtained through turbidimetric readings.

Results and Discussion

Table 1 presents the results.

For chickens, the mean weight of the drip was 10 per cent of the total weight; of this drip, approximately 5 per cent consisted of solids. The drip contained appreciable amounts of thiamine, riboflavin, and niacin.

While the percentage of drip weight to total weight varied from 8 to 10 per cent with the chickens, this percentage fell to a smaller proportion in the turkey experiments, bearing out the assumption that the ratio of cut surface area is a governing factor in drip quantity. However, the percentage of solids in the drip of the turkeys was slightly higher.

It was noted in these experiments that a part of the drip consisted of water incorporated in or on the poultry during freezing. The amount of water varied considerably, but in one turkey in each of the two tests, the water in the intestinal cavity was considerable and affected the quantity of drip and the quantity of nutrients found in the drip per 100 cc. of drip. (Frozen poultry processors can increase weight by freezing a considerable amount of water with the poultry. Of course, this should not be considered a legitimate practice.)

From these estimates, it is apparent that drip from frozen chickens contains an appreciable amount of vitamin which is lost when the poultry is allowed to thaw completely and the drip discarded prior to cooking.

Watt and Merrill (10) give the following values for the edible portion of raw broilers: thiamine, 0.08 mg. per gm.; riboflavin, 0.16 mg. per 100 gm.; and niacin, 10.2 mg. per 100 gm. Comparing data obtained in this study with those of Watt and Merrill, it is indicated that while the drip from frozen meat will contain approximately the same percentage of thiamine as the drip source, the percentage of riboflavin and niacin in the drip will be less than that of the frozen poultry. Riboflavin is, of course, much less soluble in water than the other two vitamins. Also, the drip loss from chickens was somewhat within the same range as for liver and muscle meats reported by Kotschevar (2, 3). It should be remembered that a part of the drip obtained in this study was water frozen with the poultry in processing.

Thus, it is apparent that cooking poultry from the frozen state will save nutrients, but there are accompanying disadvantages to this method of procedure. In frying chicken, there is the problem of spattering and sticking, of separating the pieces so that each will receive uniform heat. Also, in broiling chickens which are still frozen, the outside becomes

TABLE 1

Drip losses occurring during thawing of chickens and turkeys

TEST	TOTAL WEIGHT (range)	DRIP WEIGHT (range)	DRIP LOSS		SOLIDS IN DRIP		VITAMINS IN DRIP					
							Thiamine		Riboflavin		Niacin	
			Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Chickens												
	gm.	*gm.*	%	%	%	%	*mg./100 gm.*	*mg./100 gm.*	*mg./100 gm.*	*mg./100 gm.*	*mg./100 gm.*	*mg./10 gm.*
I	1110.1–1140.6	122.2–147.3	10.8–13.0	11.6	5.02–5.12		0.04–0.05	0.05	0.08–0.05	0.06	7.20–5.62	6.48
II	1125.0–1133.2	95.5–122.5	8.0–10.8	8.9	5.15–5.30		0.05–0.06	0.06	0.07–0.09	0.09	6.05–6.81	6.31
III	1122.4–1137.4	90.5–124.4	8.1–10.9	9.4	4.86–5.65		0.04–0.05	0.04	0.07	0.07	3.82–8.96	6.76
Mean*				10.0		5.0		0.05		0.07		6.51
Turkeys												
I	9069.2–9148.5	169.5–257.0	1.4–2.8	2.5	6.78–6.85		0.05–0.06	0.05	0.04–0.09	0.05	5.22–7.96	6.59
II	8127.9–9497.5	172.0–517.1	1.8–6.4	4.1	4.04–5.98		0.05–0.06	0.05	0.08–0.09	0.07	5.67–5.76	5.71
Mean*				3.3		6.0		0.05		0.07		5.61

*Obtained before rounding off individual values for use in this table.

overdone by the time the interior portions are cooked, and shrinkage, especially of the leg, detracts from the appearance. Also, Lowe and Keltner (11) proved that cooking poultry from the frozen state requires both more fuel and time.

On the other hand, thawing time must be considered in preparation time. Lowe *et al.* (12) suggest the use of foil for roasting turkeys which shortens cooking time and prevents spattering and loss of moisture.

This study would suggest that refrigerator defrosting of the wrapped turkey before cooking might be recommended, and that the drip either be added to the bird or saved for use with other drippings for gravy.

In present commercial freezing practice, the smaller pieces of chicken are fitted into the back cavity and the chicken is then frozen in a block form. Tests show that fitting the chicken together in a flat form would speed thawing during cooking, and this might be desirable.

Taste, too, is a factor in making recommendations. In one test conducted by the author, chickens were cooked from the fresh, thawed, and frozen state and presented to a taste panel of four people. The tests were not as extensive as those done by Kotschevar (3); the panel was considerably smaller, and the tasters were not considered a laboratory or expert panel. Of the preferences expressed, half preferred fresh chicken, half frozen. No preference was indicated for chicken cooked from the thawed state. Kotschevar presented his panel with ten paired muscle meats cooked from the frozen and thawed state; 75 per cent preferred meat cooked from the frozen state (3).

Summary

Losses of thiamine, riboflavin, and niacin in the drip of thawed frozen poultry were studied. Percentages of drip obtained from cut-up chickens were high enough to indicate that such losses may be significant. This did not hold true for whole eviscerated turkeys.

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Increasing Milk Drinking in Schools

To learn how milk consumption among school children can be increased, the U. S. Department of Agriculture has sponsored studies through state educational agencies. Some of the results reported thus far are of interest.

In Louisiana, the inauguration of the Special School Milk program caused the average per capita consumption of milk by boys to increase 10.2 per cent in eight schools, but for girls, the average decreased 1.0 per cent. Boys began to drink more milk at the seventh grade level and from there upward the trend generally was toward greater consumption. On the other hand, milk drinking among girls of the ninth grade level upward tended to decrease.

In eighteen schools in Alabama, making milk available through vending machines resulted in an increase in a six-week period of 17.8 per cent consumption, or an increase in daily per capita consumption from 0.692 to 0.815 half-pints of milk. Control schools for the same period showed a drop of 6 per cent in consumption.

The effect of temperature of milk at serving on consumption was studied in thirty-two Georgia schools. Four milk-handling practices were compared: from a refrigerated bulk milk dispenser; from a refrigerated box, iced or mechanical; from an unrefrigerated area (room temperature) after refrigerated storage; and from an unrefrigerated area after delivery (milk not refrigerated after delivery). No relationship was found between the volume of milk rejected and the temperature at serving. Average milk rejected daily per child approximated ⅓ oz. In the school where milk at the highest temperature (46° to 63°F.) was served, rejections varied from 4 to 9 ml.

Determining Work Loads by Random Ratio-Delay Sampling[1]

MAXINE WILSON[2]

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IN COLLEGE and university residence hall operations the largest share of the total budget is spent by the food department. Increases in recent years in food prices and labor cost make it necessary that every effort be made by management to take advantage of all minor, as well as major savings (1).

Industrial engineering has introduced motion and time techniques, and studies made in industry have resulted in lower labor costs (2–5). These techniques are gradually being adopted in the food field. The recently developed random ratio-delay technique is another business method that may be used for studying labor costs and certain other management problems of food service. As described by Sammet (6), this method is essentially a sampling process which involves: (a) a machine or worker whose activity is divided into several categories; (b) a large number of instantaneous and, for practical purposes, random and independent observations of the work; and (c) the theory that the ratio of a random sampling of observations to the total number of observations possible will yield a reliable estimate of the ratio of time expended in that category to the total time. Sammet advises that to avoid bias in classifying the observations, they should be made on an instantaneous basis, with care taken to eliminate any tendency to anticipate what the work status should be or unconsciously to exercise a preference for recording the work status in one way or another.

Brisley (7) states that by using random observations in sufficient number to yield an accurate cross section, it is possible to reach the same results as with continuous measurements. Nadler and Denholm (8) agree with Brisley and point out that this technique is not as expensive or as tedious as a continuous study. It is even possible for the observer to be interrupted without ruining the study. Also, the workers under observation are not as critical of the technique because they are not studied every minute (9). This method of random ratio-delay was used to survey the student work loads reported in this study.

Background for the Problem

Increasing labor costs at a large midwestern university emphasized the need for evaluating the manhours required to perform the jobs handled by student employees in a residence hall food service operation. The food manager observed that two of three units similar in size had comparable payrolls, while the third was consistently higher.

For the purpose of this study the halls were called Hall 1, 2, and 3. The kitchen layouts for the halls were much the same except that Hall 2 was equipped with a cafeteria counter in a separate serving room. In Halls 1 and 3, which were equipped at a much earlier date, a movable cook's table was converted into a cafeteria counter for serving.

A study covering six months of the 1952–53 students' payroll was made. Hall 2 had the highest payroll for each month of this period, with total expenditure more than 36 per cent higher than in Halls 1 or 3. The average student wage was 64.37 cents per hour for Hall 1; 66.04 cents per hour for Hall 2; and 66.97 cents per hour for Hall 3.

The number of student work hours in the various units was examined to determine whether this would account for the higher payroll in Hall 2. Total hours of work in Hall 2 *were* higher than in the other two.

It was also found that although the largest number of meals were served in Hall 2, this was not in proportion to the increase in the payroll. One student employee was used for every 476 meals served in Hall 1, one student employee for every 375 meals served in Hall 3, and one student employee for every 356 meals served in Hall 2. Thus more money

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[2] The author wishes to acknowledge the help and advice of the following: Sylvia M. Hartt, Professor of Institution Management; Helen M. Townsend, Manager of Foods and Housekeeping, Men's Quadrangle; H. H. Young, Professor of Industrial Engineering, School of Mechanical Engineering; and V. L. Anderson, Ph.D., Professor, Statistical Laboratory.

for salaries was spent in Hall 2, more student hours were used, and fewer meals per student employed were served than for either of the other two halls.

Procedure

This study was carried out for the evening meal over a four-week period. The dinner, or evening meal was selected because there was more similarity in jobs for that meal than for lunch or breakfast. Dinner involved a greater amount of student working time, and the student employees were more apt to be given the same tasks as class schedules interfered with the breakfast and lunch meals. Also, because more student employees were used for the evening meal, this meal involved a larger portion of the money and hours spent for student labor. The kitchens in Halls 1 and 2, hereafter referred to respectively as Kitchen 1 and Kitchen 2, were chosen for study.

The first step was to obtain a random sample of the population of time for a sampled meal. This population was the total minutes for which a student would be paid during the meal under observation. The hours of 4:00 to 7:00 P.M. became the observation time; hence this time-population was 180 min.

The time population of 180 min. was divided into six 30-min. periods. During each of these periods, five 1-min. observation times were made by means of random selection. This gave thirty 1-min. random observations spread over a 3-hr. serving time for each day, or a maximum of 120 observations for a four-day week.

To make the random selections of the time units, two sets of wooden disks, one of which was numbered 0–29 and one numbered 30–59 were used. Five disks were selected arbitrarily from one set. For instance, if the first set were used and the disks number 0, 25, 15, 12 and 2 were drawn, the clock time to be used would be 5:00, 5:25, 5:15, 5:12 and 5:02. A similar drawing was made from the second set of disks for the next 30-min. period of the time population.

It was necessary first to observe the students'

Worksheet Used for Tabulating the Observations*

A. Nana	D. Douglas	G. Mary Lee	Date: 5-4-54
B. Alice	E. Lois	H.	Kitchen: 2
			Meal Count: 161
C. James	F. Art	I.	Comments: one cook served

Tasks	Clock Time of One-min. Observation Period													
	5:25	5:32	5:39	5:43	5:48	5:56	6:11	6:17	6:21	6:27	6:29	6:32	6:37	6:39
Serves coffee	B		B		B									
Serves meat	A	A	A	A	A									
Serves vegetable 1														
Serves vegetable 2	G	G	G	G	G									
Tops plates	E	E	E	E	E									
Pours milk						B								
Busses food		D	D	D	D									
Pots and pans—washes	C	C	C	C		C								
Dishes—racks		F					F		CD	BD				
Dishmachine—operates								F	F	F	F	D	F	
Dishes—dries			F	F	F	F		D	BEG	AB	AE	BE	BCDE	
Dishes—stores							C	CG				C		
Trays—cleans										BC				
Eats														
Delay	DF	B				ADE	ADEG	AE	A	G		FG	AG	BCDFG

*This worksheet has been shortened for purpose of publication.

tasks to determine what duties were performed. These tasks were tabulated, compiled, and used to develop a worksheet. An abbreviated form of the worksheet used for tabulating the observations is illustrated. Second, a position was established in the kitchen from which all students under observation could be seen. When the random time occurred, an instantaneous observation was made, and the work status of all student employees was recorded by checking the appropriate column on the worksheet.

Preliminary Analysis

To simplify the analysis, the tasks shown in the worksheet were grouped according to similarity in performance. For example, the tasks "Serves coffee," "Serves meat," "Serves vegetable 1," and "Serves vegetable 2," were grouped into the over-all task, "serve." For statistical analysis, the groups were consolidated even further. To do this, the variances between observations within the kitchen–task–day combination were investigated by a range chart given by Burr (10). Homogeneous groups were developed by eliminating any task which fell outside the 1 per cent level of the average range for the group. This resulted in the following five groups.

Homogeneous Task Group I
- Set up and pour milk
- Set up line
- Employees' table
- Food preparation
- Disposal

Homogeneous Task Group II
- Set up centers
- Set up and serve desserts
- Bussing
- Pots and pans—trays
- Counters
- Miscellaneous

Homogeneous Task Group III
- Serving
- Eating

Homogeneous Task Group IV
- Dishes
- Delay

Homogeneous Task Group V
- Coffee

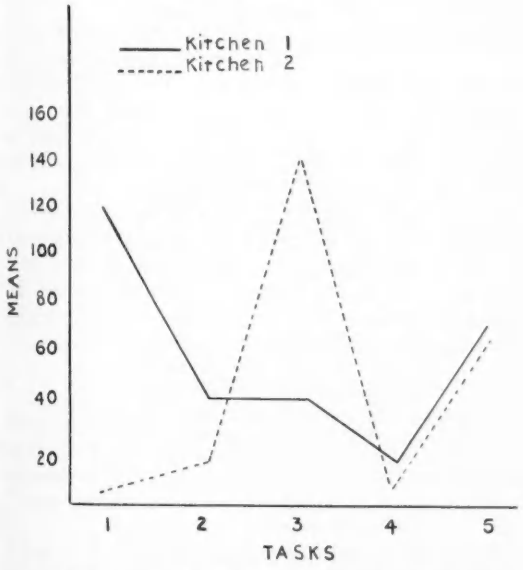

Fig. 1. Interaction of the kitchens and tasks for Homogeneous Task Group I for Kitchens 1 and 2.

An analysis of variance within the above homogeneous groups was made as described by Snedecor (11). The interaction of tasks by kitchens indicated that some tasks required less performance time for Kitchen 1 than for Kitchen 2, but other tasks required more time. To learn whether one kitchen required significantly less time for a given task, the Duncan and Donnor test (12) was used.[3]

The standard error of the means for all kitchen–task combinations was found. Figure 1 shows in graphic form the interaction of the kitchen and tasks for Homogeneous Task Group I for both kitchens.

The difference in means between the two kitchens from Group I was found to be significant at the 1 per cent level for the tasks "Set up and pour milk," "Set up line," "Employees' table," and "Food preparation."

Another comparison was made to show the difference between the two kitchens. To do this, percentage of observed time spent on each task in the kitchens was computed. It was found that even though the total time used was greater in Kitchen 1, the percentage of the time distributed among most of the tasks was similar to that of Kitchen 2. Greater differences were found for the tasks of "Serving" and

[3] A more detailed discussion of the statistical method is given in the original thesis.

TABLE 1

Percentage of time spent on the individual tasks in Kitchens 1 and 2

TASK	OBSERVED TIME SPENT ON EACH TASK		DIFFERENCE BETWEEN KITCHEN 1 AND 2
	Kitchen 1	Kitchen 2	
	%	%	%
Homogeneous Task Group I			
Set up and pour milk	4.3	0.2	4.1
Set up line	1.7	0.4	1.3
Employees' table	1.7	3.5	−1.8
Food preparation	0.7	0.2	0.5
Disposal	2.8	1.8	1.0
Homogeneous Task Group II			
Set up centers	4.3	6.0	−1.7
Set up and serve desserts	3.9	1.9	2.0
Bussing	4.1	5.9	−1.8
Pots and pans—trays	18.1	17.1	1.0
Counters	3.2	7.2	−4.0
Miscellaneous	2.8	4.6	−1.8
Homogeneous Task Group III			
Serving	17.7	6.5	11.2
Eating	34.7	44.7	−11.0

"Eating." This may be seen in Homogeneous Task Group III of Table 1.

Findings

The major findings of this study were as follows:

The "Delay task" was not a significant item, indicating that the higher payroll in Kitchen 2 was not the result of students being paid for time in which they were not working. This meant that other factors must account for the additional time needed for the performance of their duties.

Differences were revealed by the random ratio-delay method for the various groups in the interaction of tasks with kitchens. An explanation of the differences follows:

HOMOGENEOUS TASK GROUP I

Task 1—Set up and pour milk. More time was required in Kitchen 1 than in Kitchen 2 to set up and pour milk because waiters were used in Kitchen 2 for this task. Since only kitchen employees were observed, waiters' time was not recorded; therefore, the difference in assignment of this task in the two kitchens made a comparison impossible.

Task 2—Set up line. In Kitchen 1, more time was required to set up the line because in this kitchen a cook's table was converted into a serving table. Kitchen 2 used a separate serving room with built-in equipment.

Task 3—Employees' table. Less time was needed to set up and clear the employees' table in Kitchen 1 because the waiters helped with this task. In Kitchen 2, a kitchen employee was assigned to this work. The use of waiters' time invalidates the comparison.

Task 4—Food preparation. In Kitchen 1, more time was used because a student employee assisted the cook with the final preparation of the vegetables. In Kitchen 2, a cook performed this task.

Task 5—Disposal. For this task there was no significant difference between the observed time in the two kitchens, due to the fact that one disposal was used for both kitchens. The disposal was located approximately the same distance from each unit.

HOMOGENEOUS TASK GROUP II

Task 1—Set up centers. The task of setting up centers required more time in Kitchen 2. A student employee was assigned to set up the butter plates, jam, jellies, mustard, catsup, and other condiments, while in Kitchen 1 this was done by the cooks and a student employee who also made coffee.

Task 2—Set up and serve desserts. Kitchen 1 employees spent significantly more time on Task 2 than those in Kitchen 2 because of the arrangement of the kitchen. It was possible for the students working in Kitchen 2 to set up the desserts and place them directly into a push-through refrigerator. The employees in Kitchen 1 set up their desserts at the end of a counter, stored the trays in a refrigerator until needed, when they were transferred to the serving line. The distance involved was great enough to account for the increase in time.

Task 3—Bussing. The kitchen layout again was the reason for the difference in time used in the kitchens. The employees in Kitchen 1, where less time was used, transported food about three-fourths the distance required in Kitchen 2. In Kitchen 1, the student employee doing pots and pans was able to buss food in addition to his other duties but in Kitchen 2, a student was unable to combine any task with bussing.

Task 4—Pots and pans and trays. It is noted in Task 3 that the washing and drying of pots and pans in Kitchen 1 was combined with that of bussing food. As a result, it would seem that in Kitchen 1 more time would be spent on pots and pans than in Kitchen 2, but this was not true. The student's job was much smaller in Kitchen 1 than in Kitchen 2. The cooks in Kitchen 1 were able to wash and dry their pans as they used them during the afternoon; therefore, only the pans used in serving the meal were left for the student employee. The cooks in Kitchen 2, however, left most of the pans for the student employee.

Less time was also needed for washing trays in Kitchen 1. This was a result of the layout of the kitchen. In Kitchen 1, the trays were placed on the dishmachine table, washed, dried, and placed in storage on a tray rail located approximately 3 ft. from the point of washing. In Kitchen 2, the trays were washed at the end of the dishmachine table, dried, and transported to the serving room for storage. The distance was eight times that of Kitchen 1.

Task 5—Counters. The task of cleaning the counters took more time in Kitchen 2, due to the use of the separate built-in serving unit. The stainless steel counters in Kitchen 2 had to be cleaned after each serving period. Since Kitchen 1 did not have a stainless steel counter, employees needed only to clean the cook's table used for serving.

Task 6—Miscellaneous. More time was used in Kitchen 2 than in Kitchen 1 for the "Miscellaneous" tasks. In reviewing the observations, it was found that in Kitchen 2 a student employee cleaned the steam-jacketed kettles and the stoves, tasks which were done by the cooks in Kitchen 1.

HOMOGENEOUS TASK GROUP III

Task 1—Serving. More student employees' time was used for serving in Kitchen 1 than in Kitchen 2. In Kitchen 2 several cooks helped to serve. Because of this difference in personnel, a valid comparison of this task was impossible.

Task 2—Eating. Student employees in Kitchen 1 took less time than in Kitchen 2 to eat. This was a result of the attitude of the students. In Kitchen 1,

the students ate and went back to work immediately. Those in Kitchen 2 took the full 30 min. allowed for their meals.

HOMOGENEOUS TASK GROUP IV

Task 1—Dishes. There was no significant difference between the time spent in the two kitchens in the task of washing dishes. Thus the two dishmachine crews were about equal in efficiency, as the work loads in the two units were similar.

Task 2—Delay. There was no significant difference in the delay observations between the kitchens.

HOMOGENEOUS TASK GROUP V

Task 1—Coffee. The task of coffee-making was handled as a separate analysis. In Kitchen 1, coffee was made in ten-cup glass coffee makers, while in Kitchen 2 a coffee urn was used. It was impossible to compare these two operations since the difference in equipment would not give a fair comparative picture of the work-time utilized. It took less time to make the coffee in the urn.

Summary and Recommendations

This study was undertaken to determine why the student payroll in one residence hall food service was greater than in other similar units. The findings indicated that this unit will necessarily continue to have a greater payroll as long as the differences in equipment and kitchen layout remain unchanged.

A direct relationship between the student payroll and the assignment of duties was noted, and a re-evaluation of jobs was recommended. A further study should be made of the job analysis on all full-time and part-time employees. The redistribution of the work-load could result in more efficient use of full-time labor, thus reducing the number of work hours needed for the students.

A significant factor was the difference in time spent by student employees for eating. This was partly due to the attitude of the students and to supervision. In order to standardize this, a more uniform program of in-service training for student employees should be provided.

The difference in time spent in making coffee was due to the need for institutional equipment in Kitchen 1. The addition of a coffee urn would correct this situation.

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What Is a Fruit?

An acorn can just as readily make claim to being a fruit as the largest, juiciest Delicious apple. So can a single, shriveled corn kernel. Writing in *Science Service*, Horace Loftin explains that cucumbers, coconuts, and blackberries are also considered fruits.

Each of these different fruits bears one or more seeds which contain the embryos of future plants. In the flower, the seeds are found in a small structure called the ovary. So, among all plants bearing flowers, the "fruit" is basically a transformed and ripened ovary containing seeds.

The part we eat in a succulent apple is really food material stored in the altered, ripening ovary of the apple blossom, which surrounds and protects the seeds found in the core. This is the basic pattern of a fruit, but many fruits differ in "design" from this picture, For instance, with the corn kernel, the only sign of the ovary is a thin, hard coat which is tightly bound to the seed. Still, the presence of this bit of ovary coat is enough to make botanists class a kernel of corn as a true, single-seeded fruit.

Berries show interesting variations of fruit structure. Those like the blackberry, with small "globes" on each berry, come from a single flower bearing several ovaries. Each globe of the berry represents one of these ovaries. Incidentally, tomatoes come from flowers with compound ovaries.

Mulberries have yet another structure. They are formed from clusters of individual flowers, and each of the mulberry "globes" represents the fruit of a separate flower.—*From Science Digest, May 1956, page 85.*

Dr. Joseph Goldberger

His Wife's Recollections[1]

MARY FARRAR GOLDBERGER

Biloxi, Mississippi

EVERY spring after the death of my husband, Dr. Joseph Goldberger, I received letters begging for help from the pellagra-ridden of Arkansas, Mississippi, Texas, Alabama, and the Carolinas, unaware of my husband's death. They were ignorant, illiterate appeals couched in pitiful phrases that, while often humorous, still tore the heart. For instance, one was received after the prison experiment and the subsequent publicity in the press which read: "Dear Doc: I seen your ad in the paper, please for GOD's sake, send me C.O.D., treatment for pellagra."

Though Italy, Spain, Egypt, Roumania, and southern France had known pellagra for almost two centuries, it was not alarmingly prevalent in our South until about 1908. It became a major problem among the Negroes and the tenant farmers, and sporadic cases of the disease occurred in other parts of the country.

Dr. Casper Casal, in 1735, was the first recorded observer to announce the belief that pellagra was of dietary origin. He wrote: "Food rendering the body susceptible and the atmosphere through an inherent and MALIGNAUT acting as the precipitating cause of the malady." Following through the years, there were many conflicting theories advanced. When the U.S. Public Health Service began working on the problem, the most popular and widely discussed theory was that of Sanborn, who placed pellagra among the infectious diseases, with its intermediary host the buffalo gnat.

From Detroit, on February 9, 1914, Dr. Goldberger wrote me: "I enclose a letter which speaks for itself and me too. Of course, I appreciate the compliment and, of course, I wrote to Dr. Blue [Dr. Rupert Blue, former Surgeon General of the U.S. Public Health Service] that I would 'go to it.' I must confess, however, that I have never faced anything with greater reluctance." The letter from Dr. Blue assigned him to the pellagra work. Later, sitting on the front steps of our home on Rock Creek Church Road, we discussed his new assignment. We had been separated for six months before our daughter Mary's birth. She was a very young baby, and I was desolate at the thought of being alone again with four young children. Joseph, too, was not happy about the orders. He knew nothing about pellagra and had never seen a case.

But, when he started out on this, his most famous hunt, he went with an open mind, unbiased by any man's view and trusting only to his keen powers of observation. He visited orphanages, insane asylums, and hospitals all over the South where there were cases of pellagra. He studied the literature on trains and in hotels at night. Soon it struck him that those who worked with pellagra handled the sick children but never contracted pellagra; also, that the children of a certain age and babies who had milk were never known to have the disease. Why?

The Orphanage Experiment

He found that the diet of the sick children was very different from that of other groups. He gained the consent of the Baptist Orphanage in Jackson, Mississippi, where 60 per cent of the children had pellagra in the spring, to change the diet, which was customarily: *breakfast* (6 A.M.)—grits, brown gravy, biscuits, and sirup; *lunch* (12 noon)—one roll; *dinner* (3 P.M.)—vegetable soup; boiled vegetables, i.e., turnips, sweet potatoes, cabbage; corn bread or molasses. Some pork was served once a week for Sunday dinner. Dr. Goldberger added to this diet: an egg and a glass of milk for breakfast; another glass of milk at lunch; and a serving of lean meat with the vegetables for dinner. The astounding result was that in a few months he *had not one case of pellagra.*

This convinced him that he was on the right path. He wrote to me (Jackson, Mississippi, October 3, 1914): "Nothing to do but work; however, I have the satisfaction of knowing we are making progess. What do you think of this? Dr. Waring and I were going over the grounds when a boy of seven or eight broke from the line of orphans that were passing by,

[1] Presented before the 38th Annual Meeting of The American Dietetic Association in St. Louis, on October 20, 1955.

grabbed me around the legs and said, 'Are you the man giving us all the good things to eat?' I said, 'yes,' and asked whether he didn't like them. He very quickly replied, 'Oh! indeed we do. I hope you won't stop.' At this place we think that 60 per cent of the children had pellagra this spring. But if you exclude those children who work, or whose duties gave them extra food, the percentage goes so frightfully high that I don't dare name it. Not one of the matrons or other employees had pellagra. Their diet was distinctly better than that furnished the children. A little muckraking would not hurt the poor helpless children. They are not as well fed as cattle."

The Prison Experiment

Then began the conversion of the doctors, who wanted to give medicine or whose experience seemed to point to the efficacy of certain treatments. Doctors generally were not converted to the dietary theory until Dr. Goldberger and Dr. G. A. Wheeler, also of the U.S. Public Health Service, produced the disease by diet in an experiment with twelve convicts at the Rankin State Prison Farm in Mississippi.

Dr. M. J. Rosemau of the Harvard Medical School was so enthusiastic about the orphanage studies that on April 2, 1915, Dr. Goldberger was asked to deliver the Cutter Lecture at Harvard, where his work made a deep impression. Before that lecture, however, he was making preparations for the now-famous prison experiment, and he wrote me on January 23, 1915: "We will get the dozen volunteers and in due time have them all together and start on the special diet. The only thing that is bothering me is that Cutter Lecture at Harvard hanging over me. I hate to be in such a fix. That is, I hate to be in a position that obliges me to give thought to a matter that is essentially frivolous when matters of real vital importance demand all my thought and attention."

On April 19, 1915, twelve convicts at the Mississippi State Penitentiary were offered unconditional pardons by the Governor if they would, for a period not to exceed six months, submit to a diet prescribed by Dr. Goldberger. When they learned that the diet was to consist of corn meal, grits, rice, wheat flour, cane sirup, sugar, sweet potatoes, cabbage, collards, and pork fat, they thought the whole thing was a huge joke. This was the diet that some of them liked and were regularly accustomed to outside of prison walls. Far more than twelve almost fought for the chance to gain their freedom so easily. But before the six months were over, Dr. Wheeler, who had direct charge of the experiment, had his hands full.

Let Dr. Goldberger's letter to me tell the story (Birmingham, Alabama, April 15, 1915):

"I prefer to defer 'speech making' until we have gotten out our real stuff. After we get that into print, I shall be in favor of breaking the publicity line hard. We will have something then that will have weight with the mob on the street or the street corner, for that matter. After all, he is the fellow we are after, not the 'high brow' who is more interested in a hair-splitting discussion of the derivation of the word 'pellagra' than getting the true faith and a decent diet to the plain, everyday worker and his family. I am strongly for carrying the true faith to Chap and Mrs. Chap, who are living on bread and molasses and who have pellagra, than to Mr. and Mrs. Silk Stocking who have an interest in the subject to the extent of discussing it over their beef steaks."

Two months later he wrote (Jackson, Mississippi, June 20, 1915): "My first business here is to see the orphan children. They are all well. I don't know how convincing such a demonstration may be to others. To me it is entirely so. We surely can stop pellagra by a correction in diet. What is more, I think, I have reason to believe that before long we will be able to show that the reverse is also possible, experimentally—that is, that pellagra may be produced in a healthy vigorous adult by an unsuitable change in diet. I am fairly confident that we will be able to present convincing evidence within a comparatively short time, that we have the correct solution to the problem of pellagra, for preventive purposes. You have had a mighty tough time of it for two years now, but you have the satisfaction of knowing that your sacrifice has not been without return, for the work I have done, or better that you and I have done, will be a milestone in the history of preventive medicine. The knowledge we have gained will be sure to save thousands of lives annually—thousands of lives of your own Southern people, not to mention the misery of many years of suffering and ill health of thousands of others."

I wrote him from Washington (October 7, 1915): "Your cryptic telegram with the great news, for it must mean that one of those men has the eruption of pellagra, came today. It only justifies me the more in my opinion that politics to the contrary, your light cannot be hidden in a bushel. It is a wonderful thing rounding out the proof conclusive of your great work for humanity and you can well be proud and happy. God bless you, you are a prophet, and you can well be proud and happy."

He wrote on October 30, 1915: "I need hardly tell you that I have been and still am under considerable strain. I do not yet realize that we have really and truly produced pellagra in great big and vigorous men by just feeding improperly. However, it is a fact about which seven who have seen the patients agree. I have had the assistance of two expert dermatologists. These men independently express the opinion that this can be done. They both, again independently, agree that the skin manifestations are typically pellagrous. It seems to me that the diagnosis is established.

"I am crazy to get to you and the babies. I do

want to congratulate you for you have been a 'real sure enough partner' in this work. And I want to thank your precious mother and dear father who were so generous to us this summer.

"I have been so pleased and touched by the evidence, pleasure, and satisfaction with which our success was shown by those of our medical friends here who 'know.' I refer particularly to Dr. E. H. Galloway, Dr. Watkins, and Dr. Stangly. Galloway was our good angel; it was his interest and enthusiasm that persuaded Governor Brewer of Mississippi to make the test possible. Governor Brewer impresses me as a really big man, and science and especially his own people of Mississippi owe him much, for they will greatly benefit by the results of the work that his bigness of vision made possible.

"Last but not least, I am pleased for Wheeler's sake—he and his brave little bride who lived at the Prison Farm where living has not much to be desired. Wheeler has had a hard time and has been under severe and continuous strain. He was just the man for the job. He was sadly depressed when I first went there as he thought that we had failed, and he felt so certain that we would succeed if we could have just a little more time. He offered to give up two months' pay for just another three or four weeks; but it seemed a little more time was the last thing we could get. Two days changed all this. He now realizes that we have all the 'results' we need, and he now wears the newest 'fall' smile—a smile that I hope will never come off."

Disbelief after Proof

Even after this dramatic experiment, the world of doctors generally and some men of science were still unconvinced that pellagra was due to a deficient diet alone. Dr. Goldberger was badgered with verbal brickbats and harangued by the doctors. One noted physician in Atlanta spoke of "Goldberger's half-baked experiments." Dr. McNeal, a professor of medicine at Columbia University, accused him, at the meeting of the alumni at Belleview which he had been asked to address, of "faking the prison experiment." There, among his colleagues and as a graduate of Belleview Medical School, he answered McNeal by saying, "I do not wish to get in a controversy with Dr. McNeal. I shall rest on my published works on pellagra." As he left the hall, a colleague slapped him on the back and said, "Joe, you—a Jew—taught us to behave like Christians." Joseph answered, "Wasn't the first Christian a Jew?"

He wrote on November 25, 1915: "The blind, selfish, jealous, prejudiced asses will write themselves down in more conspicuous letters by braying forth their so-called criticisms."

Final Tests Give Proof Positive

Badgered, tormented, and unbelieved, yet with the knowledge in his soul that here he had a solution of a major problem of public health which would regenerate and upbuild the South were it put to practical use, he and his faithful disciple, Wheeler, on April 25, 1916, resorted to heroic measures. They made themselves the first subjects of a series of experiments to prove that pellagra could not be contagious.

Secretions were obtained by wiping the nose and naso-pharynx of pellagra patients with a cotton swab. These swabs were transferred at once, rubbing them over the mucosa and naso-pharynx first of Dr. Wheeler by Dr. Goldberger, and then of Dr. Goldberger by Dr. Wheeler. Further experiments took place in that month, and in May and June of 1916. Seven separate groups (twenty men and one woman) swallowed in capsules the most nauseating diabolical concoctions made up of secretions of blood, feces, and urine of pellagra patients. Dr. Goldberger himself was a member of each of these groups. On May 7, 1916, I begged to be one of the volunteers and joined him, Dr. Wheeler, and four other men at the hospital in Spartenburg. The men would not consent to my swallowing the pills, but I was given by hypodermic in the abdomen an injection of the blood of a woman dying of pellagra. This was an act of faith; it took no courage. Not one of us ever showed, as a result, any symptoms of pellagra.

When Dr. Goldberger had finished his experiments in the human family, he returned to the Hygienic Laboratory in Washington and in the following fifteen years, he and his associates produced pellagra in dogs (known as blacktongue to veterinary surgeons). He also discharged insane patients as cured at Millegeville, Georgia—patients whose insanity was due to the last stages of pellagra.

His first observations led him to the conclusion that a well balanced diet was the preventive of pellagra. This still holds today. No one who eats a well balanced diet has the disease. But he went further in his research as the years progressed. By unremitting and patient work, he discovered that the lack of a vitamin (which he named the pellagra-preventive vitamin) in the food and the absence of an amino acid were part of the deficiency. The vitamin has since been called "G" for Goldberger, but the English call it "B_2." He preferred to call it "pellagra-preventive" or "PP" and vigorously objected to the present nomenclature of the vitamin. He also discovered that dried or autoclaved yeast, or yeast in any form in sufficient quantities, was 90 per cent preventive for pellagra. At the Hygienic Laboratory he tried to find a cheap food to supplement eggs, milk, and meat in the diet of the poor. How stupid to tell poor people to eat more eggs, meat, and milk which they have not the money to buy!

To the glory of nutritionists in the Department of Agriculture, The American Dietetic Association, and the Red Cross, be it said that they, unlike the

doctors, accepted Dr. Goldberger's work and have preached, worked, and spread the doctrine of a balanced diet as a preventive of pellagra.

Dr. Goldberger died in the Naval Hospital, right next to the Hygienic Laboratory on the Potomac. The King of England was sick at the same time, and I know that he had no better care than the Navy doctors gave my husband. They sent for the great physicians all over the country to see him. The Commanding Officer of the Naval Hospital gave me his private room at the hospital for my use. They did everything known to medicine to save him, but they were fighting that dreadful enemy cancer. It was a rare form and was not diagnosed until a few weeks before his death.

Honor began to pour unto him after his death—an acclaim he had never received in his lifetime. A few weeks before he was taken sick, we were out walking one day, and I began to complain about the lack of appreciation and the absence of honor that were his due. I shall never forget his beautiful smile when he turned and said, "I know what I have done, and it is a satisfaction to my soul which no one on earth can take from me." Three weeks before he died, Harvard sent him word that for the fifth time they were sending his name for the Nobel Prize. He was too weak to reply, so he asked me to write and tell them that no prize on earth was worth the love and honor of his colleagues.

During the twenty-six years since his death, his name has become an immortal one in medicine as a pioneer in our knowledge of nutritional diseases.

Goldberger—The First Clinical Nutritionist

In November, 1954, at the fall meeting of the Food and Nutrition Board, Dr. Russell M. Wilder was presented with the Joseph Goldberger Award for 1954, which is presented on behalf of the Council of Foods and Nutrition of the American Medical Association. In accepting the award, Dr. Wilder said:

"I was almost prepared to say that I couldn't see why they picked me for this award, but then I realized that the real reason that the Council of A.M.A. might have chosen me was because of the work of this Board (Food and Nutrition Board). I accept this award, not for myself so much as for the Board.

"This is an extremely appropriate place to give this award, before these people who really earned it for me, so to speak, and also here in Washington on the banks of the Potomac, where Joseph Goldberger contributed so importantly to the welfare of mankind. His early work in the Hygienic Laboratory, which later became the National Institutes of Health which you know now, was on typhoid fever. Washington at that time, about 1902, was decimated by typhoid fever. The Potomac was a cesspool. Through Joseph Goldberger's efforts, that dreadful situation was corrected.

"From there, he went further into infectious diseases. Every disease he studied, he acquired himself. He almost died from yellow fever in Tampico. He developed dengue fever in Texas, and diphtheria in Detroit.

"I knew him first when he was desperately ill with typhus fever in Mexico, but fortunately he recovered. I was down there at the time working with Howard Ricketts on typhus fever. He was there with John Anderson, who then was Director of the Hygienic Laboratory, working on typhus fever.

"With all that experience in infectious diseases—and I have mentioned only a part of it—he was presented with this problem of pellagra, to which the last twenty or twenty-five years of his life were devoted. There he manifested that extraordinary ability to determine the causes of things, and because of his experience with infectious diseases, he was able to rule out infection quickly. However, it took him twenty-five years to convince his colleagues that he was right and that pellagra was not an infectious disease but, instead, a disease due to malnutrition.

"So Joseph Goldberger was really the first to put clinical nutrition on the map in this country, and a magnificent job he made of it."

Current Comment

Cost of Fringe Benefits[1]

RUTH GOULD AND KATHERINE HART

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FRINGE benefits, or the non-wage costs of labor, have been found to comprise the largest single factor in increasing labor costs in industry. In a study by the Economic Research Department of the United States Chamber of Commerce in 1953(1), the average payment of fringe benefits was 19.5 per cent of the total labor payroll, or $739 per employee. This was an increase of 66 per cent during the preceding four-year period.

These fringe labor costs are present also in the food service industry and parallel the national pattern of increases. Michigan State University is located in a competitive labor market with the automotive industries and the state government. Thus, the personnel programs in local industry and state civil service determine to a great extent the college policy for wage practices. In a tight labor market, in an area that has a strong union overcast, in a situation that demands precision operation to meet financial obligations, the Department of Dormitories and Food Services at Michigan State University felt that an attempt to isolate fringe benefit costs in the University residence hall food services would be valuable. For this purpose, the labor costs of the Women's Residence Hall food service were analyzed for the fiscal year, July 1, 1952, through June 30, 1953. This was the most recent accounting period for which complete cost figures were available.

The Women's Residence Halls of Michigan State University included six dormitories in 1952–53, with a total census of 2300, the individual buildings ranging in census from 273 to 421. There were 97 regular full-time food service employees.

The food services employ both regular full-time employees and part-time student men and women. Only the regular employees are eligible for the fringe benefits. However, in the residence hall food service operations, the part-time student workers form an integral part of the labor force. Women student workers live in the residence halls, and they, as well as the men student workers, are a part of the total number served.

[1] Submitted by Ruth Gould in partial fulfillment of the requirements for the degree of Master of Science, School of Graduate Studies, Michigan State University, East Lansing. This paper comprised one portion of a presentation by Katherine Hart before the Tri-State Hospital Assembly in Chicago, on May 1, 1956.

Certain fringe benefit costs to management which add to the employee's pay are provided almost universally in industry today. These costs include: paid vacations, paid holidays, paid sick leave, and workmen's compensation fixed by law. These are considered as direct fringe benefits in this study.

In addition, it was decided to obtain data on certain indirect labor costs in college food services, including: employees' meals, food furnished in rest periods, uniforms furnished, laundry of uniforms, and health service charges. These costs, in contrast with direct costs, were generally recorded by food service managements as operating expenses.

Pensions and retirement plans of all kinds are considered by industry as fringe benefits; in fact, they are the largest item in that category in many business operations. However, at Michigan State University, the expense of the pension plan is borne entirely by the University and not by the individual residence hall food service. Thus pensions were classified as miscellaneous administrative costs.

Four methods were selected as bases for the computations of fringe benefits:

(a) As percentages of labor payroll for the year.
(b) As percentages of annual income.
(c) Dollar value per employee.
(d) Dollar value per person served.

Direct Fringe Benefits

The direct fringe benefits are readily recognizable as non-wage labor costs: vacations, holidays, sick leaves, and workmen's compensation. They amounted to 10.37 per cent of the labor payroll and cost $215.02 per employee (Table 1).

The total cost of vacations was $8801.05 and represented 4.15 per cent of the total labor payroll. This was the second largest fringe benefit cost, exceeded only by rest periods. Vacation pay averaged $86 per employee, which was more than two weeks' pay on the average-pay base. Michigan State University policy on vacations in 1952–53 granted two weeks' pay at the completion of a full year of satisfactory service or one week at the end of six months' service. In the case of residence hall and food service employees, the ten months of fall, winter, and spring terms were counted as a full year of service.

Since vacations were allowed on a graduated scale based on length of service, a relationship might be found between this cost and labor turnover. The amount paid for vacations could change radically from year to year. A high turnover for employees might result in a lower cost of this fringe benefit,

but the cost of training and turnover would undoubtedly more than offset the reduction.

Regular employees with six or more months' service were paid for six holidays: New Year's Day, Independence Day, Memorial Day, Labor Day, Thanksgiving, and Christmas. This totaled $5596.36, the fourth largest fringe benefit cost, and amounted to $57.69 per employee.

Policy on sick leave pay with Michigan State University states that the employee earns one day's sick leave per month for the first year, or a total of twelve days per year, which may be accumulated to thirty days. Food service employees must furnish a statement from their doctor and must also notify their supervisor concerning their illness, to be eligible for sick pay. Table 1 shows the high cost of sick leaves for the residence hall food service operation in 1952–53. Sick leave amounted to $6096.03 and was the third largest fringe benefit, outranked only by rest periods and paid vacations. It averaged $62.85 per employee or 3.03 per cent of the total labor payroll.

Workmen's compensation payments amounted to only 0.18 per cent of total labor payroll, or $3.75 per employee for the year. This fringe benefit ranked eighth of the nine benefits studied and pointed up the value of close attention to safety and elimination of work hazards.

Indirect Fringe Benefits

The indirect fringe benefits isolated in this study were not readily available in the records kept by food service management. There was a policy concerning the amount of time granted for rest periods during the working day, but no cost figures were kept. Cost of laundry and uniforms furnished, as well as charges made by college health services, were treated as operating expenses. Employees were charged a flat rate for meals, the total being deducted from their checks. Because these costs were of financial value to the employees, they were considered to be fringe benefits and were computed as such.

Rest periods cost more than paid vacations and were the largest fringe benefit given to food service employees, amounting to $9652.17 or 4.8 per cent of the total labor payroll (Table 1). Since the policy of allowing rest periods during the working day has become generally established and appears to be closely related to morale and production, any attempt by management to reduce this cost might result in more costly grievances and production lags. None of the other indirect fringe benefits studied, i.e., laundry, meals, uniforms, health service charges, amounted to more than 1.5 per cent of the total labor payroll.

Total Cost of Fringe Benefits

The total cost of the food service benefit program for 1952–53 in the Women's Residence Halls of Michigan State University was $37,199.59 (Table 1). This was 18.49 per cent of the total labor payroll for the year, which was remarkably close to the average of 19.5 per cent for American industry as a whole in 1953. Total cost per employee for all fringe benefits studied was $383.50. On the basis of $79.77 for an average pay check, more than nine weeks' pay was received by the individual employee in the various fringe benefits in 1952–53.

TABLE 1

Fringe benefits of food service employees of the residence halls for women, Michigan State University, 1952–53

BENEFIT	TOTAL	PER CENT OF LABOR PAYROLL	COST PER EMPLOYEE	COST PER PERSON SERVED	PER CENT OF FOOD SERVICE INCOME
Direct Fringe Benefits					
Vacations	$8,801.05	4.15	$86.00	$3.26	0.78
Holidays	5,596.36	2.78	57.69	2.19	0.52
Sick leaves	6,096.03	3.03	62.85	2.38	0.57
Workmen's compensation	363.68	0.18	3.75	0.14	0.03
Total	$20,857.12	10.37	$215.02	$8.16	1.95
Indirect Fringe Benefits					
Rest periods	$ 9,652.17	4.80	$ 99.51	$3.77	0.90
Laundry	3,039.41	1.51	31.33	1.19	0.28
Meals	2,195.26	1.09	22.63	0.86	0.20
Uniforms	1,307.13	0.65	13.48	0.51	0.12
Health service charges	148.50	0.07	1.53	0.06	0.01
Total	$16,342.47	8.12	$168.48	$6.39	1.52
All Fringe Benefits					
Total benefits	$37,199.59	18.49	$383.50	$14.55	3.46

Since this study was made, additional benefits have been made available to employees of the University. Policy on vacations now allows three weeks' pay at the completion of five years of service, and four weeks after fifteen years. Also, since July 1, 1955, Social Security has been included in the nonwage labor payments for employees. Both of these factors have added to the over-all cost of fringe benefits in the food services.

A sobering fact is readily apparent: when a worker is hired today or a new wage contract is agreed upon, the wage rates established no longer measure the cost of hiring labor and the number of hours actually worked no longer measure the number of hours for which the employer must pay. Roughly, one dollar out of every five payroll dollars is absorbed by fringe benefits.

REFERENCE

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Food and Operating Costs at a College Cooperative House[1]

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OPERATING costs and food distribution costs from 1942 to 1954 for Emily Abbey House, a cooperative residence at Connecticut College for Women, are shown, compared, and analyzed in this study. Food distribution costs for Mosier House, an earlier cooperative residency at the college, are included for the period 1939 to 1942. Records prior to that date were not available. All costs are based on annual summaries of cost expenditures for the residence.

Monthly as well as annual summaries of expenditures are prepared by the housefellow who is a trained home economist and a member of the home economics department. She is responsible for the financial as well as over-all management of the house. She also advises the students in relation to meal planning, food orders, and preparation of food. Criteria of the Basic 7 are followed in planning the dietary.

Twenty-six girls live in the cooperative house. It is considered a form of scholarship and girls from any class may apply to live there. Bases for selecting students aside from scholarship are: character, health, and need for financial assistance. The college, in addition, provides various jobs for student employment, and many girls living at Emily Abbey House take advantage of this opportunity.

Cooperative living presents a challenge to students with its emphasis on democratic living as cited by Kumler (1). Values of democratic living, cooperation, and practical experience in home living should serve to make the student more able to find her place in society after formal education is completed. Cooperative living at Connecticut College has proved successful to this end.

All work at Emily Abbey House is shared by the girls; no paid help is employed. This factor accounts for the significant financial saving realized by the girls. In addition, it enables them to acquire practical experience in various aspects of homemaking, for many of the girls have had no such previous experience. A plan for job rotation is the basis for division of duties; this is the responsibility of the housefellow. The various jobs can be grouped under six headings: hostess, receptionist, dish jobs, housekeeper, cook, and waitress. In addition, each girl has one "free week" during the year when she has no job. During the course of a year, a girl should do each of the various jobs if her class schedule will permit.

During her hostess week, a student may invite a member of the administration or faculty to be a dinner guest of the house. She plans the menus and food orders and at the end of the week records the cost of foods purchased for that time. Compilation of weekly food costs for the entire year is the basis for determining the percentage of the food dollar expended for each item.

Food Costs

Most of the food is purchased locally. Milk is bought from a local dairy and delivered daily. Meats come from a local super-market, and fresh fruits and vegetables are ordered from a local wholesale establishment. These items are delivered three times a week. Staples and canned goods are purchased periodically from a wholesale distributor. All food bought is itemized under the headings shown in Table 1.

Cereal products have, on the average, accounted for 7 per cent of the total food costs. Fats show an average expenditure of 4 per cent. Sweets and also miscellaneous items, such as coffee, condiments, and relishes, represent an average of 5 per cent of total food costs. Fruits and vegetables account for an average expenditure of 26 per cent. There was some variation in amounts spent for vegetables while outlay for fruit remained relatively constant.

Purchases of milk and meat consistently account for the greatest expenditure of any food item; the average expenditure for these groups is 49 per cent; the range is from 42 to 58 per cent. When eggs, meat, and milk are grouped, a resulting range of expenditures from 49 to 64 per cent occurs, with an average of 54 per cent. Generally, a greater amount was expended for meat, including fish, poultry, dried peas, beans, and legumes, than was spent for milk; however, from 1944 to 1949, more money was spent for milk and milk products than for meat. A proportionately large amount was expended for eggs between 1943 and 1948. This was during the rationing of World War II and the purchase of meat meant a proportionately greater outlay of the food dollar; therefore more eggs were bought to supply protein in the diet.

Expenditures at Other Institutions

Amounts spent for eggs and meat compare with those reported by Leverton and Ellison (2) in a study of cooperative living at the University of Nebraska and with figures reported by Johnston (3) at Purdue University home management houses. Comparison of food expenditures from these universities and Connecticut College over two different ten-year periods is shown in Table 2.

[1] Received for publication April 3, 1956.

[2] Grateful appreciation is expressed by the writer to former housefellows whose data made this study possible, and to Dr. Margaret S. Chaney, Chairman, Home Economics Department, Connecticut College for Women, for her continued interest in the development of this study.

TABLE 1

Food expenditures for Emily Abbey House from 1939 to 1954 expressed as percentages of the total food cost

YEAR	CEREAL	MILK	MEAT	EGGS	FRUITS	VEGETABLES	FATS	SWEETS	MISCELLANEOUS
	%	%	%	%	%	%	%	%	%
1939–1940	6	21	27	3	12	17	7	5	2
1940–1941	6	23	29	3	11	15	7	4	2
1941–1942	6	22	25	3	10	16	8	5	5
1942–1943	5	26	29	4	9	13	5	5	4
1943–1944	8	24	24	6	11	15	4	3	5
1944–1945	6	23	21	8	12	17	3	4	6
1945–1946	7	22	20	7	11	16	3	3	11
1946–1947	7	26	20	8	10	12	4	6	7
1947–1948	8	27	22	6	9	15	5	5	3
1948–1949	8	26	23	5	10	16	4	5	3
1949–1950	8	24	26	6	12	13	3	5	3
1950–1951	6	28	30	6	8	10	3	3	6
1951–1952	5	25	25	6	10	15	3	5	6
1952–1953	5	21	22	6	13	18	3	6	6
1953–1954	6	25	26	5	10	15	2	6	5
Average: 1939–1954...	7	24	25	5	11	15	4	5	5

At Connecticut College, a larger percentage of its food dollar was spent for milk and milk products than at either the University of Nebraska or Purdue University in comparable periods. This may be due to difference in wholesale price or in the amount of milk bought. At the Purdue University home management houses, 1 pt. milk per day per person was the average allowance, while at Connecticut College the average was 1½ pt. per girl, and in addition, powdered whole milk was purchased for cooking.

Both universities spent more for fruits and vegetables than did Connecticut College, but in other categories figures compare more closely.

In a study by Scoular and Foster (4) in 1945 to determine how food consumption of college women at North Texas State Teachers College compared with that in other studies, a high protein intake was reported. An average of 49 per cent of the food dollar was spent for meat, milk, and eggs which compares closely with the average for the same year at Emily Abbey House, namely 52 per cent. Expenditures for cereal, vegetables and fruit, fat and sugar were comparable for both colleges.

Operating Costs

Food costs when compared to over-all operating costs in Table 3 represent a range of 44 to 50 per cent of total expenditures with an average of 47 per cent during the twelve-year period. This represents the greatest expenditure for any one item. In contrast to this, telephone costs represent only 1 per cent of the total expenses from 1944 to 1948. Since it is a pay station phone installed on a guaranty basis, no significant expense results unless terms of the guaranty are not met by individual calls.

Values for electricity and water, oil, and telephone have been grouped together as utilities. Household expenses have been grouped and include costs for household items, supplies, cleaning, and laundry. In this way operating costs of five categories—food, rent, utilities, household, and miscellaneous—may

TABLE 2

Comparison of average expenditures for food groups in cooperative and have management houses of two universities with those at Emily Abbey House, Connecticut College (expressed at percentages of total food cost)

INSTITUTION	MEAT	MILK	EGGS	FRUITS AND VEGETABLES	CEREALS	FATS	SUGAR	MISCELLANEOUS
1938 to 1948								
	%	%	%	%	%	%	%	%
Purdue University (3)	20	16	5	33	8	8	2	8
Connecticut College	24	24	5	26	7	5	4	5
1941 to 1951								
University of Nebraska (2)	21	14	6	35	12	12*	—	—
Connecticut College	24	25	6	25	7	4	4	5

* Figure reported includes expenditures for fats and sugar; no figure given for miscellaneous expenditures.

TABLE 3

Operating costs for Emily Abbey House from 1942 to 1954 expressed as in percentages of total

YEAR	RENT	UTILITIES	HOUSE-HOLD	FOOD	MISCEL-LANEOUS
1942–1943	36	9	5	47	3
1943–1944	38	9	6	46	1
1944–1945	34	10	8	46	2
1945–1946	33	10	8	44	5
1946–1947	32	9	7	50	2
1947–1948	27	13	10	47	3
1948–1949	27	10	8	50	5
1949–1950	29	11	9	50	1
1950–1951	27	11	11	50	1
1951–1952	31	13	7	48	1
1952–1953	34	12	8	45	1
1953–1954	34	13	7	45	1
Average: 1942–1954	32	11	8	47	2

readily be compared per year as well as for the entire study in Table 3.

Rent paid to the college twice a year accounts for an average of 32 per cent of operating expenses. Services rendered by the college to the house include summer repairs, painting, upkeep of grounds, and waste collection.

Since the girls work in groups cleaning the various areas of the house at the end of each semester, a saving is realized in this category. Two girls are paid to do the remaining cleaning in the spring and to set the house in order in the fall. Cleaning establishment costs are also included under this heading.

Paper, soap, cleaning, as well as miscellaneous kitchen supplies, average 2 per cent of total expenses, as do miscellaneous expenses and laundry costs. Most paper supplies are bought from the college. Purchases of furnishings, equipment, and linens are grouped as household expenses and bought as needed.

Combined expenses for electricity, water, and oil range from 9 to 13 per cent of total expenditures, with electricity and water representing an average of 4 per cent. Electricity is provided by the college power plant.

Conclusions

Aside from the daily routine, allowance is made for more extensive hospitality projects which mean an additional expense of time, effort, and money but in return give added values of satisfaction and pleasure. Time and effort are factors to be considered constantly; efficiency in their use is the responsibility of each girl. To this end, prepared food products and labor-saving devices are an asset. The planning, effort, and work of each girl in this co-operative plan of living gives in return broader educational values and a financial saving. Following this pattern of living has resulted in a nutritively well-balanced diet and a rather consistent pattern of operating expenses and food distribution costs at Emily Abbey House for the twelve year period 1942 to 1954 as reported in this study.

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(2) Leverton, R. M., and Ellison, J.: Ten-year study of the cost and nutritive value of the self-planned diets of college girls. J. Home Econ. 45: 326, 1953.
(3) Johnston, B. J.: Food expenditures at Purdue in home management houses. J. Home Econ. 42: 449, 1950.
(4) Scoular, F. I., and Foster, L. B.: Food intake of college women. J. Am. Dietet. A. 22: 401, 1946.

Antibiotics to Preserve Fish

Antibiotics can be used to keep fish fresh twice or three times as long as present-day methods. Out of fourteen antibiotics tested, chloromycetin, achromycin, terramycin, and Aureomycin markedly retarded the spoilage rate of fish fillets, according to work reported by Peter Yakoubosky-Lerke and Lionel Farber, Fisheries Research Laboratory, University of California, before the International Meeting of Fish Processing Technologists in Rotterdam, Netherlands, June 25 to 29. The meeting was organized by FAO.

One test showed that while untreated fillets were spoiled after four days, those treated with 10 p.p.m. of these four antibiotics spoiled after eight, eleven, ten, and thirteen days respectively.

Other U. S. scientists—R. Pasternack, A. G. Malaspina, C. L. Wrenshall, and R. C. Ottke—pointed out that when used at low temperature levels, antibiotics are "not bactericidal but bacteriostatic" and best results are obtained when using them in conjunction with refrigeration. Antibiotics are effective only against bacteria. An antimycetin agent, such as sorbic acid, is effective in salted, dried, and smoked fish against molds and yeasts.

Antibiotics can be incorporated in ice for use in keeping fish fresh. Fish can also be sprayed or dipped in solutions of antibiotics.

No country has yet approved the use of antibiotics to help preserve fish, but the Rotterdam meeting, which was attended by experts from some twenty-five countries, showed that experiments are being carried out in many parts of the world, including Canada, Denmark, Germany, Japan, Netherlands, Norway, and Great Britain, as well as the U. S.

The meeting also heard papers on such other subjects as brine cooling of California sardines and mackerel and objective assessment of raw fish quality.

Book Reviews

Dictionary of Dietetics. By Rhoda Ellis, Ph.D. N. Y. Philosophical Library, 1956. Cloth. Pp. 152. Price $6.

The author has included, along with terms from the fields of medicine, physiology, biochemistry, and dietetics, the names of about one hundred foods, some terms relating to food preparation, and the names of less than a dozen scientists from Berzelius to Sherman.

The dietitian who is uncertain about the meaning of terms included in this book will find more accurate and complete information in the usual tools of her profession, such as the *Handbook of Diet Therapy* compiled for The American Dietetic Association by Turner, text books on nutrition and biochemistry, and a medical dictionary. For nutritive values of foods, she will turn directly to Agricultural Handbook No. 8, and for terms related to food preparation, to the *Handbook of Food Preparation*, published by the American Home Economics Association. The reference librarian who is called on to help the layman will find many discrepancies between definitions given in this book and those in standard works of reference.

This publication differs from the usual dictionary in including more detail about a number of items. For example, under "Dietary Allowances" the table of Recommended Dietary Allowances of the Food and Nutrition Board is reproduced, without footnotes, but with comment on the differences between the 1953 revision and previous recommendations. The Minimum Daily Requirements, U. S. Food and Drug Administration, are also included under "Dietary Allowances." The author does not say that these were designated for use in labelling foods, but makes the unwarranted statement that "the levels chosen are such that less would produce demonstrable deficiency signs." Under "Carbohydrate," classifications of vegetables and fruits according to carbohydrate are given; under "Exchange," headings for "Bread," "Fruit," "Meat," "Milk," and "Vegetables" are included, and the lists from "Meal Planning with Exchange Lists" with the exception of the items in Vegetable Group A are reproduced.

A feature of this dictionary is the inclusion of references to original sources in many places. Under "Dietary Analysis, Short Method," for example, reference is made to the article by Leichsenring and Wilson, in this JOURNAL (29: 386, 1951); and under "Dietary Allowances, Requirement of U. S. Food and Drug Administration," the Federal Register, Nov. 22, 1941 is cited as the source. In some other places where such references would be equally appropriate, however, they have been omitted. Under "Appetite Training Program," for example, one finds "A new approach to the feeding problem devised by Dr. R. W. Keeton of Chicago to restore the normal desire for food in patients." No hint is given as to the nature of this approach, nor is the reader referred to Dr. Keeton's article in this JOURNAL (26: 336, 1950). Reference is not made to Publication 302 of the National Research Council as the source of the table of Recommended Dietary Allowances, nor to the booklet "Meal Planning with Exchange Lists" as the source of the exchange lists quoted, although under "Exchange, Food," the author notes "meets with the approval of" the committees which prepared the booklet.

In the descriptions of some therapeutic diets, details which would not apply in all cases have been included. Under "Diet, Gastric Resection," for example, the reader is told that this diet is "very much like a gastroenterostomy diet except that on the 8th day half size portions are given and an in-between snack at 4:30 and 6:30 p.m."

Among the diets listed, one finds two ("Vitamin A-Test" and "Vitamin B Complex-Test") which are rations designed for production of deficiencies in rats. These seem out of place, since no other information is given which might be of help to a person wishing to demonstrate, experimentally, the effects of dietary deficiencies.

Evidences of careless work and poor editing are found in the use of terms such as: American Dietetics Association for The American Dietetic Association, American Diabetics Association for American Diabetes Association, and Food and Nutritional Board for Food and Nutrition Board.

Cross references are lacking in many instances. One finds, for example, "Food Protection Committee," identified as "part of the Food and Nutrition Board of the National Research Council" but no information about the Food and Nutrition Board under *F*. One suspects that the author had in mind the Food and Nutrition Board, rather than the National Research Council, when she wrote: "President Roosevelt had called this meeting in May, 1941, to mobilize science for defense of the war effort. . ." The Food and Nutrition Board was organized late in 1940, and proposed the first Recommended Dietary Allowances in May, 1941, whereas the National Research Council was established in 1916 as a defense measure, and became a permanent organization by executive order of President Wilson in 1918.

Omission of cross references is particularly noticeable in the case of some of the vitamins. Pyridoxine is listed, but not pyridoxal, pyridoxamine, or vitamin B_6; indeed, members of the B-complex are not included under "Vitamins," although references to the B-complex occur frequently in definitions, i.e. riboflavin and niacin are described as members of the B-complex, and cyanocobalamin as "crystalline vitamin B_{12}." Ascorbic acid is described as "commonly referred to as vitamin C," yet vitamin C is not listed under "Vitamins."

In some cases, lack of knowledge on the part of the author may be responsible for the absence of cross references. She describes cocarboxylase as "a phosphoric ester of vitamin B_1; all nucleated cells can form cocarboxylase; recognized as a coenzyme of (sic) vitamin B_1 in 1937." Diphosphothiamine is defined as "a coenzyme; abbreviation DPT; food material needed by the body for its synthesis includes thiamine, phosphate, magnesium." Not only are these definitions inaccurate, but one suspects that the author did not recognize cocarboxylase and diphosphothiamine as two names for the same substance.

Some of the definitions are not informative, others are untrue. The following examples illustrate the point:

"Cake: a flour mixture with or without fat or carbon dioxide as a leavener; . . ."

"Casein: a nucleoprotein derived from milk; . . ."

"Hydrolysis: The chemical breakdown of a compound to another compound and water; . . ."

"Insensible perspiration: An increase in water loss brought about by fever; . . ."

"Nucleic acid: Any one of the class of acids containing albumin, sulfur, phosphorus and sometimes iron; . . ."

One can only hope that this book will seldom be used as reference by persons who lack the background to evaluate its contents.—*Hazel M. Hauck, Ph.D., Professor of Food and Nutrition, New York State College of Home Economics, Cornell University, Ithaca.*

Current Literature

Contributed by Janette C. Carlsen and Ethel M. Miller, Dietary Department, The Johns Hopkins Hospital, Baltimore; Elizabeth H. Tuft, Executive Dietitian, Chicago Wesley Memorial Hospital, Chicago; and the Journal staff

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* Clinical use of sorbitol as a sweetening agent in diabetes mellitus. C. R. Shuman, R. L. Kemp, R. Coyne, and M. G. Wohl.—p. 61.
* The claim of "lack of effect of high fat intake on serum lipid levels." Letters to the Editor. A. Keys.—p. 74.
* Comment. Letters to the Editor. G. V. Mann.—p. 76.

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The effects of nutritional deficiency on the heart. A review. R. H. Follis, Jr.—p. 107.

* Serum cholesterol concentration in new-born African and European infants and their mothers. I. Bersohn and S. Wayburne.—p. 117.
* Intestinal absorption and hepatic uptake of radioactive vitamin B_{12} in various age groups and the effect of intrinsic factor preparations. G. B. J. Glass, A. A. Goldbloom, L. J. Boyd, R. Laughton, S. Rosen, and M. Rich.—p. 124.
* Studies of niacin requirement in man. III. Comparative effects of diets containing lime-treated and untreated corn in the production of experimental pellagra. G. A. Goldsmith, J. Gibbens, W. G. Unglaub, and O. N. Miller.—p. 151.
* Lysine and tryptophan content of proteins and their utilization for human growth. A. A. Albanese, R. A. Higgons, G. M. Hyde, and L. Orto.—p. 161.
* Relation between caloric intake, body weight, and physical work: Studies in an industrial male population in West Bengal. J. Mayer, P. Roy, and K. P. Mitra.—p. 169.
* Development and role of a food clinic. Diet Therapy. C. E. Forbes.—p. 178.

Vol. 4, May-June, 1956

* The effects of supplementary calories on nitrogen storage at high intakes of protein in patients with chronic liver disease. I. C. Plough, F. L. Iber, M. E. Shipman, and T. C. Chalmers.—p. 224.
* The prevalence and incidence of obesity in a cross-section of elementary and secondary school children. M. L. Johnson, B. S. Burke, and J. Mayer.—p. 231.
* Dietary intake and social characteristics. J. K. Boek.—p. 239.
* Methods for preparing diets low in sodium and high in protein. S. Beychok, A. Kathman, H. Baron, and I. S. Kleiner.—p. 254.

Nutritional status of selected adolescent children. M. McG. Hard and N. C. Esselbaugh.—p. 261.

* Effect of food intake on amino acids in human plasma. E. S. Wynne and C. L. Cott.—p. 275.

Fiber in the diet. Diet Therapy. C. H. Robinson.—p. 288.

Estimating Caloric Intake. In this assessment of the accuracy and significance of dietary histories, it was found that the differences in daily caloric intake from person to person are so small that the composition of the diet might be more important. Dietary histories appear to provide a valid basis for estimating food intake of population groups but not of individuals. The nomogram of Boothby and Berkson was shown to be valid and useful in nutritional studies for checking the accuracy of dietary histories.

Relationship of Ethnic Group Diets and Atherosclerosis. The Italians and Jews were the two ethnic groups observed. They ate similarly in terms of total calories and fats and still showed a striking difference in the prevalence of both atherosclerosis and hypercholesteremia. It would seem unlikely that the slight dissimilarity in animal fat intake could explain the differences. It follows that the predisposition towards both coronary disease and hypercholesteremia among Jews might be related to genetic or other factors rather than diet.

Complications Associated with Obesity. Many complications associated with obesity seem to be correlated with the way in which excess fat is distributed over the body rather than with the degree of obesity. Several types of obesity are discussed in terms of their degree of masculine differentiation.

Obesity in High School Girls. Obese and nonobese groups of high school girls were compared in regard to physical maturation, food intake, and activity. When caloric intakes and activity indices were compared to determine the salient energy factors in development and maintenance of obesity, it appeared that on a statistical basis, inactivity was much more important than overeating. The caloric intake of the obese group was significantly lower than that of the nonobese group, with the relatively greater energy balance being consequently supplied by inactivity.

Nitrogen Metabolism in Gastrectomized Patients. This study was to determine whether the over-all metabolism of nitrogen in totally gastrectomized patients differed significantly from the metabolism of nitrogen in normal persons. The amount of dietary nitrogen necessary to prevent negative nitrogen balances was significantly greater in the gastrectomized individuals.

Fat and Mineral Metabolism in Gastrectomized Patients. Average fecal fat excretion in totally gastrectomized patients averaged 20.2 per cent of intake—significantly higher than that calculated for normal persons. No difference was found between normal subjects and gastrectomized patients as far as metabolism of calcium, phosphorus, magnesium, and potassium was concerned.

Sorbitol as a Sweetening Agent. According to this report, a sorbitol ice cream preparation may be regarded as providing an available carbohydrate until additional studies further delineate its position in human metabolism and in the diabetic patient.

Lack of Effect of High-Fat Intake on Serum Lipids. A correspondent discusses a previous paper on "Lack of Effect of High-Fat Intake on Serum Lipid Levels," contending that the paper provided an interesting case study in statistical fallacy applied to inadequate evidence. He points out that the simplest and most impressive confirmation conceivable would be the situation where all of the experimental values are higher than any of the preceding controls.

Rebuttal. The original author of the paper discussed above concedes that other methods of study might have supplied better data. He remains of the opinion that dietary fat is neither the sole nor even an important factor in regulating the serum lipid levels and cites other work to substantiate part of his rebuttal.

Serum Cholesterol in Africans and Europeans. Findings on serum cholesterol in a study comparing infants born in South Africa to African and European mothers are reported. No statistical differences were found between the serum, free, and esterified cholesterol of the African newborn infant and the European. Highly significant differences favoring the European mothers were found, however. Since there is no evidence that serum lipids are influenced by race, confirmed by these findings at birth, the differences in the adults strongly supports the theory of dietary origin of such differences. The African diet is probably sufficient in calories, but low in animal protein, certain vitamins and mineral salts, and fat, and high in carbohydrate and crude fiber, whereas probably 35 to 40 per cent of the calories in the European diet are supplied by fat. It is suggested that maize, which constitutes a high proportion of the African

diet, may contain an antimetabolite which interferes with or competes with the cholesterol absorption. Although liver derangement is common in the Africans, the authors feel that this is unlikely to be responsible for the derangement in cholesterol metabolism, since the degree of liver damage is usually moderate. On the other hand, it is suggested that alterations in the balance between the male and female sex hormones, due to chronic liver disease, may well be involved in the differences in cholesterol levels in the Africans and Europeans.

Intestinal Absorption and Hepatic Uptake of Vitamin B_{12} in the Aged. The controversy over the possibility of a defect in intestinal absorption of vitamin B_{12} in the aged stimulated a study using sixty subjects, men and women, between the ages of eighteen and ninety, in whom cobalt-labeled vitamin B_{12} was measured. For patients under forty years, average hepatic uptake equalled 638 counts per minute per microgram Co^{60}; in those over forty, 504. For forty-three patients over sixty, hepatic uptake varied from 0 to 1227 counts, with a mean of 513—about 10 per cent less than in the younger control group. Those between sixty and eighty showed the lowest hepatic uptake, while those over eighty showed much higher means. In forty-one subjects, for whom hepatic uptake and gastric secretory function were correlated, those over sixty having hypo- or anacidity showed a significantly lower hepatic uptake than those with normal gastric acidity. The addition of a potent intrinsic factor preparation increased hepatic uptake of radioactive vitamin B_{12} by 25 per cent in almost half of the cases; in as many others, no significant change was observed, while in about 10 per cent a significant decrease occurred. Especially important was the increase in the older subjects having decreased or abolished gastric acidity, usually associated with impaired secretory output of other gastric glandular secretions. It is concluded that although there is no evidence of general impairment of intestinal absorption of vitamin B_{12} as a function of advancing age, it does occur in more older persons than younger.

Lime-Treated Corn and Niacin Requirement. In Central America, where corn is the staple cereal and is treated with lime prior to cooking, the incidence of pellagra is relatively low. An investigation was conducted to determine the effect of treating corn with lime on the production of experimental pellagra. Four subjects were maintained for six experiments on corn diets low in niacin and tryptophan. In three experiments, the corn was treated with lime, in three it was untreated. In two experiments with each type of corn, the subjects developed typical niacin deficiency between four to six weeks. In the other two studies, mild signs suggesting niacin deficiency appeared after about two months but failed to progress. Under conditions of this study, lime-treated corn failed to influence the production of experimental pellagra. With diets containing Guatemalan whole corn, pellagra was induced more rapidly than with diets containing unenriched milled corn from the U. S. These findings suggest that additional factors may operate in causing pellagra in addition to the low niacin and tryptophan content of corn.

Lysing Supplements for Infants. The value of improving the lysine-tryptophan ratio (L/T) by supplements of lysine as regards infant growth is demonstrated. Infant needs are compared with the amino acid pattern (tryptophan, lysine, methionine, and isoleucine content) of evaporated milk, a casein digest, lactalbumin, beef muscle digest, bovine plasma, and wheat gluten. Studies in which lysine was used to supplement infant diets of wheat gluten, evaporated milk, and a casein digest are reported. By raising the L/T with lysine supplements, accelerated infant growth was obtained. It is calculated that this improved nutritional state occurred when L/T ratios of 6.0 to 7.0 were maintained by lysine additions to diets which provided a minimum of 100 calories and 3.5 gm. protein per kilogram per day. Because the lysine supplements constituted less than 1 per cent of the total nitrogen intake, the improved growth rate cannot reasonably be ascribed to the increased nitrogen intake due to the lysine. The analysis of mammalian carcasses for amino acid content is recommended as an effective method for estimating requirements of some, if not all, of the essential amino acids for growth, since good agreement between growth needs and tissue amino acid patterns exists. Studies have not yet been made to learn the effect of lysine supplements on utilization of soybean preparations often used in feeding allergic infants. Practical implications of these findings in infant feeding in areas of low economic status in the world are discussed, particularly as to the possible role of amino acid deficiencies in kwashiorkor.

Caloric Intake, Body Weight, and Physical Work. Studies with rats have shown that increasing exercise creates greater food intake only within certain limits of activity. Below this level, in what is termed the "sedentary" range, decreased activity is *not* followed by less food intake but, on the contrary, a slight but significant increase and the animals increase both their weight and fat content. Enforced exercise has also been shown to decrease weight gain in hereditary obese mice, even when food is available *ad libitum*. These findings were extended to man in a study of 213 workers in West Bengal, all employed by one company but engaged in sixteen occupations which involved varying degrees of physical activity. Data on food intake and weight were obtained. Dietaries were analyzed using the Indian Food Composition Table of the Coonoor Nutrition Research Laboratories. Subjects were classed as: sedentary, light work, medium work, heavy work, and very heavy work. Caloric intake increased with activity only within the zone of "normal activity." Below that range ("sedentary zone"), decreased activity was not followed by decreased food intake but with an increase. Body weight also increased, in that zone. Graphs show body weight and caloric intake as a function of physical activity. Thus, the pattern was similar to that found in experimental animals. It is suggested that the mechanized urbanized modern living which may well be pushing an ever greater fraction of the population into the "sedentary" range may thus be a major factor in the increased incidence of obesity today.

Developing a Food Clinic. The history of the Food Clinic of the Boston Dispensary is chronicled, together with a brief description of its emergence as a teaching center. The function of the clinic in nutrition education and methods of teaching patients are emphasized.

Protein in Treating Chronic Liver Disease. Although a high-protein diet has an established place in treating cirrhosis of the liver, it has been suggested that it might be possible to maintain a large positive nitrogen balance in such patients at a lower dietary protein intake by taking advantage of the protein-sparing effect of extra carbohydrate or fat calories. A study, using three patients with chronic liver disease, was conducted to determine the feasibility of this idea. After a control period on a diet containing sufficient protein and calories to maintain positive nitrogen balance and a reasonably constant body weight, the diet was increased by 1000 calories of fat. In the following period, carbohydrate was substituted isocalorically for the fat. In the last period, the patients again received the control diet. Effects of carbohydrate or fat, or both, were studied in each patient at two or more levels of dietary protein. No evidence was observed of any change in the clinical state of any of the patients. Liquid diets, both maintenance diets, and the supplemented diets were well tolerated. The high-fat diets caused no gastrointestinal symptoms. The caloric supplements spared nitrogen in all experiments. Fat spared from 1.4 to 4.0 mg. nitrogen per added calorie; carbohydrate spared 1.4 to 6.5 mg. In two patients the effects of carbohydrate and fat were equal, but in the third, carbohydrate was twice as effective as fat. The amount of nitrogen spared by the supplements seemed to be directly related to the level of dietary protein intake. It is suggested that at lower protein intakes, an excess of calories leads to fat formation, but with high-protein intake, lean tissue is formed.

Obesity in School Children. A study in the greater Boston area of 6346 children in primary and secondary schools demonstrated that more than 10 per cent were overweight, according to the criterion of the Wetzel Grid. Mean obesity prevalence was 12.5 per cent for girls and 9.0 for boys. In all grades except 7, a higher proportion of girls were obese than boys. By study of Wetzel Grid records by grade throughout the school record, two types of obesity became apparent: "persistent" obesity, present throughout the school record which comprised a third of the overweight girls and almost half of the overweight boys; and "later" obesity present during the latter half of the record which comprised 12 per cent of the overweight girls and over a third of the overweight boys. Considerably more of the high school students classified as obese during the study had

been obese the year before than of the junior high school group. Onset of overweight tended to occur during the winter, emphasizing the importance of inactivity in the etiology of obesity.

Dietary Intake and Social Characteristics. A sampling of 184 farm operators in southern Michigan was used to correlate eight social characteristics with food habits. These characteristics were: participation in community activities, informal visiting, level of living (defined as possession of household goods and conveniences), health, income, years of schooling, size of household, and age. Dietary records were analyzed according to calories, ascorbic acid, and calcium intake. Men active in community activities had higher calcium intakes and ate a greater variety of foods than those who participated less. No relationship between the amount of informal visiting and dietary habits was found, but at different levels of living, diet varied with respect to calories and ascorbic acid, but not calcium. As income rose, so did both caloric and calcium consumption, but not ascorbic acid. No significant difference between high and low income and the variety of the diet was found. The only significant finding concerning diet and schooling was that as years of schooling rose, calcium intake of these men rose. The size of household appeared to be related to calcium intake as well as the number of foods in the diet of the head of the household. Calories and calcium intake decreased with increasing age, but there was no significant difference between older and younger men as far as ascorbic acid intake was concerned. The farm operators having the "best health" had the highest calcium intakes.

Preparing Low-Sodium, High-Protein Diets. Methods of removing sodium from various high-protein, high-sodium foods, by extraction and by dialysis, are described. The methods are suggested for use by the average housewife. The authors feel that diets containing as little as 100 to 500 mg. sodium with a satisfactory protein content are feasible, by using the methods described. Soaking of steaks, chops, liver, veal cutlets, fish, cheese, and poultry parts for 18 to 24 hr. in water is the treatment recommended. Cream, milk, and eggs can be dialyzed. Using these methods, average removal of original sodium ranged from 26 to 93 per cent. Grinding meat before soaking was found to effect as much as 90 per cent removal of sodium. Average removal from cod, halibut, and salmon was 59, 38, and 29 per cent respectively. Of the muscle meats, lamb and veal permitted the highest removal of sodium. Clinical effects of a dietary regimen using protein foods treated as recommended plus foods naturally low in sodium are reported. Thus far, no ill effects commonly attributed to the Kempner regimen have been detected. Patients have reported a gradual disinclination towards foods with a high sodium content and finally a distaste for untreated foods. Blood pressures have been lowered in all but one of fourteen patients, with the fourteenth showing no effect. Heart shrinkage is also reported. Nitrogen excretion was close to the Sherman standard of 1 gm. protein per kilogram body weight per day, the average daily urinary nitrogen excretion being 0.147 gm. nitrogen per kilogram. No symptoms of sodium depletion were observed. However, none of these patients were being treated with mercurial diuretics and none had renal complications. Although no protein determinations were made of the treated foods, loss of protein must be neglible since urinary nitrogen output would indicate that an adequate protein residue was available. Water-soluble vitamins lost in soaking were replaced by a multivitamin supplement.

Effect of Amino Acid Intake on Plasma. Studies are reported on microbiologic assays of amino acids in unhydrolyzed human plasma from blood collected both following an overnight fast and after subsequent food intake. Levels of available glycine, isoleucine, tryptophan, and tyrosine were similar in blood obtained in the fasting state and after food intake. Histidine was significantly increased after eating in 1 of 13 experiments, and arginine was significantly elevated in 4 of 11 experiments.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 46, June, 1956

* Certain aspects of the microbiology of frozen concentrated orange juice. E. R. Wolford.—p. 708.

Frozen Concentrated Orange Juice. The presence of coliform bacteria in frozen concentrated orange juice does not necessarily indicate that direct contamination has occurred. This was concluded from an experiment where coliforms were isolated from fruit aseptically picked into sterile bags. This indicates that some coliforms are among the normally occurring flora in the groves. *E. coli* was isolated from oranges being delivered to concentrate plants. Packing house wash-tank solutions were found to contain many coliforms, including *E. coli*. This may be one of the principal sources of the organism in frozen orange juice products. Surface contamination of fruit-handling equipment was most common where bits of orange pulp had accumulated. Juice and concentrate samples, when positive for coliforms, appeared to reflect the condition of the fruit used rather than sanitary conditions of the juice line. The majority of coliform-positive samples contained less than 10 coliforms per 100 ml.

AMERICAN JOURNAL OF PHYSIOLOGY

Vol. 185, April, 1956

* Increased intestinal absorption of glucose in three forms of obesity in the mouse. J. Mayer and C. Z. Yannoni.—p. 49.
* Fluoride deposition in different segments of the tibia of the young growing rat. I. Zipkin and R. O. Scow.—p. 81.

Glucose and Obesity in the Mouse. In three types of obesity in the mouse—obese-hyperglycemic syndrome, gold-thioglucose obesity, and hypothalamic obesity—there is observed an increase in intestinal absorption of glucose when glucose administration is sufficient. The difference with normal animals is due neither to differences in gastrointestinal weight nor to differences in rate of gastric emptying. This phenomenon appears to be an adaptive result of prolonged hyperphagia.

Fluoride Deposition. By inserting a stainless steel pin into the tibiae of young rats, it was possible to determine the gain in length at each end of the diaphysis and to identify the bone that was deposited at the ends during the experimental period (twentieth to fifty-first day of life). At the end of the experiment, the tibiae were divided into four segments, three of which contained portions of the diaphysis. The oven-dry, fat-free weight, ash, and fluoride content of these segments were determined. Intraperitoneal injections of 3.15 mg. fluoride over a thirty-day period, starting at twenty days of age, had no noticeable effect on the longitudinal growth rate and mass of the various tibial segments. The ash content of the various diaphyseal segments was similarly unaffected. The percentage of fluoride of the proximal diaphyseal segment was similar to that of the middle diaphyseal segment, but 35 per cent lower than that of the proximal epiphysis. After thirty days, there appeared to be no consistent relationship between the degree of calcification and the deposition of fluoride in various tibial segments in the young growing rat.

ARCHIVES OF INTERNAL MEDICINE

Vol. 97, April, 1956

* Idiopathic hyperlipemia associated with coronary atherosclerosis. J. M. Martt and W. E. Connor. —p. 492.

Hyperlipemia Associated with Coronary Atherosclerosis. Although idiopathic hyperlipemia is recognized to be associated with clinical coronary artery disease, this is the first recorded case of idiopathic hyperlipemia with post-mortem evidence of coronary atherosclerosis. The vitamin A-tolerance test showed extremely high levels of serum vitamin A at 5 hr., supporting the concept of the pathologic physiology of this entity, i.e., an impaired or delayed clearance of dietary fats from the serum. The treatment consists of a low-fat diet which promptly alleviates symptoms of angina pectoris and abdominal pain.

BULLETIN DER SCHWEIZERISCHEN AKADEMIE DER MEDIZINISCHEN WISSENSCHAFTEN

Vol 12, April 1956

* Lipoproteidstudien zur ätiologie und therapie der arteriosklerose. A. Thurnher and W. Niederberger.—p. 1.

Paper Electrophoretic Studies on Serum Lipoproteins. It was concluded that high serum lipoprotein values are indicative of caloric disequilibrium, caused by over-rich diet or disordered utilization of calories. Temporary hyperlipoproteinemia alone does

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not lead to arteriosclerosis. Heparin, as a component of lipoprotein lipase, helps to break up the accumulation of lipoproteins in the blood. This makes it valuable in treatment of arteriosclerosis.

THE CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 74, May 15, 1956

* The influence of nutritional and hormonal factors upon immune and allergic responses to infection. D. A. Long.—p. 771.

Nutrition and Infection. Bacterial infection produces a short stage of invasion, toxemia, and destruction of tissue associated with adrenocortical hyperactivity and catabolism. With the development of immunity, a long stage of anabolism and repair is associated with a decrease in adrenocortical activity and increased insulin production. Man, monkey, and guinea pig show greater endocrinologic stability to adrenocortical stimulation than the rat, mouse, rabbit, or ferret. These species are also divided in their susceptibility to delayed bacterial allergy of the tuberculin type in resistance to cortisone, and in inability to synthesize ascorbic acid. Thyroxine-treated guinea pigs are more sensitive to intradermally injected tuberculin and produce more diphtheria antitoxin than control animals. Insulin increased sensitivity to tuberculin, but owing to the compensatory phenomena, a direct study of the effect of insulin on antitoxin production could not easily be made. However, partial pancreatectomy abolished both hypersensitivity and hyperimmunity resulting from treatment with thyroxine. The influence of hormones on sensitivity to tuberculin is intimately concerned with ascorbic acid-sulphydryl metabolism.

CEREAL CHEMISTRY

Vol. 33, May, 1956

* Effects on baking powder biscuits of four flour components used in two proportions. M. V. Zaehringer, A. M. Briant, and C. J. Personius.—p. 170.
* The effect of light on vitamin retention in enriched white bread. K. Morgareidge.—p. 213.

Baking Powder Biscuits. Commercial hard-wheat flour and a commercial soft-wheat pastry flour were separated into four fractions—gluten, water-solubles, starch, and "amylodextrin." Thirty-two combinations were made into reconstituted flours. Certain properties of the flours, doughs, and biscuits were studied by objective measures and subjective judgments. Proportions typical of hard-wheat flour resulted in flours with higher water-absorbing power and doughs more compressible and elastic than when proportions typical of a soft-wheat flour were used. Biscuits had darker crusts, were larger and less tender. When component sources varied, wheat gluten flours had the greater sedimentation volumes. Biscuits containing hard-wheat gluten were larger, had paler crusts, were less tender than those of soft-wheat gluten. Hard-wheat, water-soluble flour produced smaller biscuits with less tender crusts and crumb. They were larger, browner, and had more tender crusts when made with hard-wheat starch flour. Hard-wheat amylodextrin flours had greater sedimentation volumes, the doughs were less compressible, and the biscuits were smaller, but with browner crusts.

Effect of Light on Enriched Bread. To determine whether enriched white bread suffers significant losses in vitamin content when exposed to normal light, as may be encountered during distribution and display in retail stores, plain cellophane, printed cellophane, and printed waxed paper were compared at three levels of illumination. There were no losses of vitamins when the bread displays were subjected to illumination for periods up to five days.

FOOD TECHNOLOGY

Vol. 10, March, 1956

* Development of a frozen pea reference standard for taste tests involving storage. A. C. Ward and M. M. Boggs.—p. 117.
* New developments in the dehydration of fruits and vegetables. D. K. Tressler.—p. 119.
* A simplified variables taste panel method for detecting flavor changes in vegetables treated with pesticides. A. Kramer and L. P. Ditman.—p. 155.
* A correlation between the heat penetration and the rate of bacterial growth during the roasting of turkeys. P. P. Iacono, C. O. Ball, and E. F. Stier.—p. 159.

Vol. 10, April, 1956

* The effect of assignment of testing materials to the paired and odd position in the duo-trio taste difference test. J. W. Mitchell.—p. 169.
* The effect of ethylene oxide treatment on the nutritive value of certain foods. B. L. Oser and L. A. Hall.—p. 175.
* Organic acids in brewed coffee. A. F. Mabrouk and F. E. Deatherage.—p. 194.

Duration of sensitivity in trio taste testing. J. W. Mitchell.—p. 201.

* The value of training a sensory test panel. G. Bennett, B. M. Spahr, and M. L. Dodds.—p. 205.

Vol. 10, May, 1956

* The antioxidant properties of spices in foods. J. R. Chipault, G. R. Misuno, and W. O. Lundberg.—p. 209.
* A study of the effects of Aureomycin-containing sea water and ices upon the storage life of round herring. T. Tomiyama, S. Kuroki, D. Maeda, S. Hamada, and A. Honda.—p. 215.
* Time-errors in the paired comparison taste preference test. J. W. Mitchell.—p. 218.
* Nutritive value of instant nonfat dry milk. A. Z. Hodson.—p. 221.

Vol. 10, June, 1956

* Post mortem changes in the interactions of cations and proteins of beef and their relation to sex and diethylstilbestrol treatment. N. Arnold, E. Wierbicki, and F. E. Deatherage.—p. 245.

Knowledge of the stimulus variable as an aid in discrimination tests. E. L. Raffensperger and F. J. Pilgrim.—p. 254.

* The quality of smoked ham as affected by adding antibiotic and fat to the diet and phosphate to the cure. I. Cooking losses, palatability, separable fat, and shear values. P. Mahon, D. Hogue, P. Leeking, E. Linn, and F. Fenton.—p. 265.
* The quality of smoked ham as affected by adding antibiotic and fat to the diet and phosphate to the cure. II. Objective color. F. Fenton, B. E. Sheffy, H. D. Naumann, G. H. Wellington, D. Hogue, and P. Mahon.—p. 272.
* The quality of smoked hams as affected by adding an antibiotic and fat to the diet and phosphate to the cure. III. Moisture, fat, chloride, and thiamine content. P. Leeking, P. Mahon, D. Hogue, E. Linn, and F. Fenton.—p. 274.
* Color changes of fats involved in the frying of a fritter-type batter. M. Bennion and F. Hanning.—p. 290.

Frozen Pea Reference Standard. When peas were handled and processed under excellent conditions, judges could not distinguish between packs stored in air and nitrogen for thirteen months at −60°F., packs stored in air at −30°F. and at −60°F. for thirteen months, packs stored in air or nitrogen thirteen months at −60°F., and freshly prepared packs of comparable raw material. Air packs, hermetically sealed, of frozen peas stored at −30°F. or below are recommended for controls in taste-panel work when storage time does not exceed thirteen months.

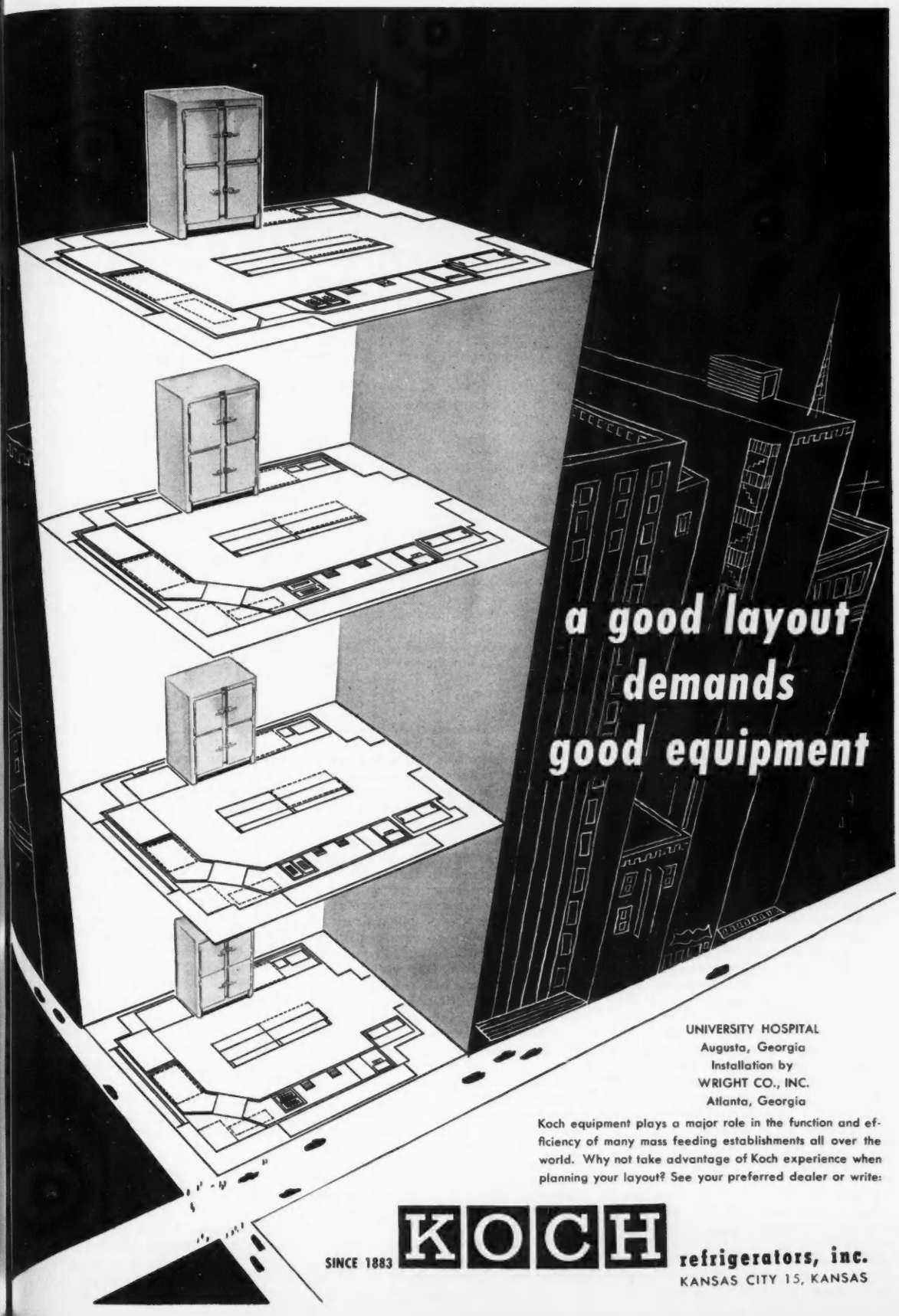
Dehydration of Fruits and Vegetables. The list of satisfactory dehydrated products now includes: apples, orange powder, grapefruit juice, tomato powder, potato granules, diced potatoes, onions, peppers, green beans, and sweet corn. It is hoped that pineapple juice powder, green peas, Lima beans, and cabbage will be added to the list soon. Dehydration methods have developed so that vegetables, fruits, and fruit juices retain their flavor, aroma, color, and texture during storage for two years at 70°F. or six months at 90° to 100°F.

Simplified Taste Panel Method. Results with five products indicate that the variables taste panel method was superior to an attributes method, such as the triangular taste test, in detecting flavor differences. The variables method requires substantially fewer tastings, and at the same time provides additional information on the direction and importance of the differences. The problem of finding the most efficient taste testing design for specific purposes has been investigated only to a very limited extent. More work, not only for the broad comparison of methods but also for answering such questions as to how much is to be gained by more elaborate training and selection of judges as compared to the use of a larger number of less well-trained judges is indicated.

Bacterial Growth During Roasting of Turkeys. It was found that the roasting of non-stuffed turkeys from the frozen state embodies no food poisoning hazard. Heat penetration data for small unstuffed turkeys roasted at 350°F. from both the frozen and thawed states were determined. They were correlated with the growth rates of the bacteria *Staphylococcus aureus* and *Salmonella aertrycke*.

Paired and Odd Position in Duo-Trio Test. Based on the results of this observation, a refinement of the duo-trio test was suggested which determines and takes advantage of the more sensitive assignment of materials. To have the greatest number of correct responses, the assignment of materials is a factor of great concern. It is shown that in testing for flavor intensity, use of the weaker material for paired samples improves discrimination. In testing for an atypical flavor, use of the typical flavor as paired samples produces more correct responses than the reverse.

Ethylene Oxide and Nutritive Value of Certain Foods. To study ethylene oxide (EO) treatment, comparisons were made of a purified diet of which only the yeast component was



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subjected to the EO treatment and a natural, stock diet prepared for chronic toxicity studies in which the entire mix, exclusive of the fat and fat-soluble vitamins, was exposed to the treatment. Small differences in moisture were noted before and after exposure, but the changes were in opposite directions in the yeast and diet mixes, respectively, and were not significant. The vitamin content was expressed on the "as is" basis. Because of the difficulty in assessing the significance of differences, the same series were determined on five additional samples. Thiamine, riboflavin, niacin, pantothenate, and choline appeared to have suffered no losses of practical significance. Pyridoxine and folic acid were lost to a degree.

Organic Acids in Brewed Coffee. Commercial coffee was used in this experiment. Two series of five coffee extractions were carried out, using distilled water and tap water to get the maximum soluble solids. The partition chromatographic method of analysis was used. The extractions contained acetic, pyruvic, caffeic, chlorogenic, which was predominant, oxalic, malic, citric and tartaric acids. Acetic acid was the lowest.

Value of Training a Sensory Test Panel. The usefulness of a measure of variance in judging individual performance and in providing a means of screening to obtain reliable observers for panel participation was pointed out. A three-week training period resulted in improved performance in judging aroma and flavor of ground beef at varying levels of rancidity. During the first week, the scoring of aroma and flavor was inconsistent. The third week had a trend toward uniformity.

Antioxidant Properties of Spices. It is known that the antioxidant effectiveness of spices depends to a large extent on the substrate in which they are used. Seventeen spices, selected on the basis of their antioxidant effects in lard, baked pie crusts, and fat emulsions in water, were studied in ground pork and mayonnaise. Four were also studied with a second mayonnaise formulation and a French dressing. Antioxidant properties in all substrates were found for allspice, cloves, sage, oregano, rosemary, and thyme. The effectiveness varied with the substrate. It was found unwise to predict the antioxidant properties of a spice in any given food product from the results obtained in some different substrates. In lard alone, sage and rosemary were found much more effective. Cloves were powerful in simple oil-water emulsion and ground pork. Oregano was most effective in mayonnaise and French dressing.

Aureomycin and Storage Life of Herring. In preserving sea foods with antibiotics, Aureomycin, terramycin, and chloromycetin have been very effective. It was found that the simplest way to hold fish after landing is in Aureomycin-ice, when the area is close to a landing port. It is better to store in an Aureomycin solution when a relatively long time is needed to get to port. The best solution is the dip-treatment and storage in the cooled dipping solution on the boat, followed by storage in Aureomycin-ice after landing. For this study, 1½ tons fish, principally Pacific round herring, were used. One to 2 per cent were sardines.

Time-Errors in Paired Comparison Tests. In taste testing, a "conditioner" sample similar to the paired samples, when presented before the first sample of a pair was found to eliminate the time-error. To find the characteristics of effect and ways of eliminating the time errors in the paired comparison tests, four classifications were used: identical samples; nearly identical from different production lots; moderately different; and very different samples. The paired comparison method was used. There was a greater frequency of choice of the first sample. The effect was directly related to the amount of taste difference between the paired samples. The greatest time-error was found when the difference was small and the least when the difference was large.

Nutritive Value of Instant Nonfat Dry Milk. Samples were analyzed on a reconstituted basis. They were mixed with a part of required water, stored in a refrigerator for 16 to 24 hr. to permit the foam to break, then diluted to the final volume, and analyzed. Thiamine, riboflavin, niacin, pantothenic acid, and vitamin B_6 contents of two brands were essentially equal to fresh milk samples. Ascorbic acid content was low. In low heat nonfat dry milk, the conversion to instant nonfat dry milk does not measurably change the thiamine, riboflavin, niacin, pantothenic acid, or vitamin B_6 content. The data indicate that neither the processing of a low heat, spray dried, nonfat dry milk nor the converting to an instant nonfat dry milk damaged the protein nutritive value for rat growth.

Post-Mortem Changes in Beef. It had been suggested that post-mortem tenderization was related to dissociation of actomyosin and/or that a redistribution of ions takes place in muscle on aging to cause increased hydration of protein and improve tenderness. It is pointed out that the importance of each cation to water-holding capacity and tenderness of meat is due to the combined effect and to the movements of the ions during post-mortem aging. Hydration and the *p*H of the meat are definitely related to tenderness. Problems such as shrinkage on cooking, texture, drip on thawing, taste, juiciness, and color as well as tenderness may be related to the ion-protein interactions, through the effect of these interactions and through the effect of these interactions on the degree of hydration of the meat. Practical applications can be adopted which will improve the production and quality of meat. One already in use is the addition of salt.

Cooking Losses and Palatability of Smoked Ham. Hams were used from animals fed a diet with an antibiotic and/or animal fat added and then cured with the addition of disodium phosphate. There were no appreciable differences in cooking losses, palatability, separable fat, or shear values. There were no significant differences in the hue values of the lean meat of uncooked hams or cooked hams which could be attributed to the diets of the pigs, the curing of the hams, or the interaction between diets and cures. The quality of ham was not lowered by feeding pigs diets supplemented with antibiotics and/or fat nor did a phosphate cure lower the quality.

Moisture, Fat, Chloride, and Thiamine Content of Hams. Under the conditions of this experiment, moisture, fat, chloride, and thiamine contents of either the uncooked or roasted hams were not appreciably affected by the diet or by the curing treatments studied. Diets containing an antibiotic, surplus animal fat, and antibiotic plus a surplus fat were fed to sixty-two Yorkshire hogs. Disodium phosphate was added to the cure. There were no statistically significant differences.

Color Changes of Fats During Frying. Only batter was fried in the following types of lard: a low temperature, continuous process rendered lard without the addition of an antioxidant; a continuous process lard with 0.05 per cent antioxidant added; a steam rendered lard without addition of an antioxidant; and a steam rendered lard with 0.05 per cent antioxidant. The Hunter Color Difference Meter was used. Color changes varied according to the composition of the flour mixture. Batter without baking powder maintained higher L values (color lightness), but showed greater increases in yellow than other batter modifications. All darkening was easy to see with the common eye.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 4, June, 1956

* Formation of alcohol, acetaldehyde, and acetoin in frozen broccoli tissue. P. A. Buck and M. A. Joslyn.—p. 548.

Formation of Alcohol, Acetaldehyde, and Acetoin in Frozen Broccoli. Investigations on the accumulation of acetaldehyde, ethyl alcohol, and related products in broccoli during freezing storage were made, with particular emphasis on pyruvic carboxylase activity. Unlike pea and wheat germ carboxylase, broccoli carboxylase was found to catalyze synthesis of acetoin and diacetyl chiefly from added pyruvate and to a much smaller extent from acetaldehyde. Acetaldehyde inhibited broccoli carboxylase activity. In frozen broccoli, both inhibition by and restricted diffusion of acetaldehyde, would favor production of acetoin. The concentration of acetaldehyde, acetoin, or diacetyl was not related to the organoleptically objectionable formation of flavors, whereas ethyl alcohol content was related to extent of off-flavors.

JOURNAL OF THE AMERICAN GERIATRICS SOCIETY

Volume 4, May, 1956

* Treatment of peptic ulcer in the aged with unrestricted diet. E. A. Marshall and M. Sass.—p. 498.

Unrestricted Diet in Peptic Ulcer. A method of treating aged patients (over sixty years of age) with peptic ulcer with unrestricted diet is presented, along with an analysis of 292 cases treated by the

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method. The physiologic basis is the immediate administration and correct maintenance of a pharmacologically adequate antacid sedative treatment, sufficient to elevate the *pH* continuously, and to prevent acid peptic activity from destroying the continuously-forming fibroblasts, and thus permit granulation and epithelialization of the ulcer. The medications used are not new, but it is their method of administration that fulfills the definition of an adequate physiologic and clinical answer to the problem. The drugs used are aluminum hydroxide, calcium carbonate, magnesium oxide, phenobarbital, and atropine sulphate in combination tablets.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 161, May 19, 1956

* Toxoplasmosis in man and swine—an investigation of the possible relationship. D. Weinman and A. H. Chandler.—p. 229.

Vol. 161, June 2, 1956

* Infantile scurvy. Council on Foods and Nutrition C. Woodruff.—p. 448.

Vol. 161, June 9, 1956

* Copper metabolism in man. Council on Foods and Nutrition. C. J. Gubler.—p. 530.
* Protein requirements. Foreign Letters-India.—p. 551.

Vol. 161, June 16, 1956

* Folic acid and vitamin B_{12} in medical practice. W. G. Unglaub and G. A. Goldsmith.—p. 623.

Bland diet and roughage in colitis. Queries and Minor Notes.—p. 668.

Cholesterol in various foods. Queries and Minor Notes.—p. 669.

Toxoplasmosis and Pork. Toxoplasmosis is considered a common infection of man, yet its transmission is almost completely unknown. It has no fixed incubation period, so it is impossible to trace a mass outbreak to the consumption of an article of food at a common meal. Unlike the Trichinella worm, it is not readily identified in sections of infected pork because of the much smaller size of Toxoplasma and its more haphazard distribution in the tissues. So far as is known, there are no cross serologic reactions between Trichinella and Toxoplasma. Experiments discussed in this study show that it may be acquired by eating undercooked pork and that the pigs might have become infected through eating infected rodents or by cannibalism. There is strong evidence that pigs are Toxoplasma carriers. The organism in the living pig may be expected to be viable when the pork cuts arrive in the kitchen. It was found that the organism could survive the attack of gastric digestion for a period equal to the average stay in the human stomach. It is thought, too, that there is more than one transmission mechanism for toxoplasmosis.

Infantile Scurvy. Scurvy among infants has increased despite advances in knowledge and application of the principles of nutrition. It occurs in infants only after relatively prolonged ingestion of a diet devoid of, or grossly deficient in ascorbic acid. An analysis of the dietary histories in the study illustrates both the types of diets that are associated with the development of scurvy and some of the reasons why antiscorbutic foods were not included in the regimen in adequate amounts.

Copper Metabolism in Man. The average adult ingests 2.5 to 5 mg. copper a day, but he will maintain copper balance on an intake of about 2 mg. Because of technical difficulties in copper balance studies, little is known of the factors governing the absorption of dietary copper. It is widely distributed in foods. Several liver copper-proteins have been isolated, representing such a small proportion of the total copper that it is hard to say whether they represent normal storage forms or some specific fraction of liver copper. It is controversial whether copper deficiency has occurred or can occur in man.

Protein Requirement. The minimum level of protein intake required to maintain nitrogen equilibrium of five Indian men was found to be 3.5 gm. nitrogen per square meter of body surface.

Folic Acid and Vitamin B_{12} in Medical Practice. Presently folic acid is used in treatment of the sprue syndrome and the macrocytic, megaloblastic anemias other than pernicious anemia. It will temporarily correct the hematologic abnormalities of patients with pernicious anemia, but has no effect on the development or progression of the neurologic complications of the disease. The tissues of the normal person contain vitamin B_{12} in varying amounts, with highest concentrations being in the liver and kidneys. The primary use of vitamin B_{12} is treatment of pernicious anemia. There is no evidence that liver extract offers any significant advantage over it. B_{12} has been suggested as a therapeutic agent for herpes zoster, Ménière's syndrome, psoriasis, chronic discoid lupus, osteoarthritis, viral hepatitis, ulcerative colitis, and allergic dermatoses, but the value of such therapy hasn't been established. In the use of either folic acid or vitamin B_{12}, adequate hematologic examinations at frequent intervals are essential. The dosage must be adjusted to the requirements of the patient.

THE JOURNAL OF THE CANADIAN DIETETIC ASSOCIATION

Vol. 19, May, 1956

* The B-vitamins of cod and haddock. P. L. Hoogland.—p. 15.
* Private nutrition counseling. M. F. Knight.—p. 20.

B-Vitamins of Cod and Haddock. Studies were made on the flesh of Atlantic cod and haddock, commercial fillets, fresh and frozen, and smoked fillets. In storage they were frozen or smoked, packed in wax paper boxes and stored in a cold room. It was found that the freezing, smoking, and storage did not affect the average vitamin levels. Comparison of the vitamin B_{12} values for cod and haddock with those for meats show they are very similar. The same is true for the other B-vitamins. Cod and haddock are reasonably good sources of the B-vitamins.

Private Nutrition Counseling. This is an account of an experience concerning private nutrition counseling as a service to the physicians and surgeons in an area consisting of three towns and several smaller communities. Included are experiences in "selling" out-patient dietetics, in nutrition counseling which averages about three evenings and one afternoon a week, and plans for giving group therapy.

THE JOURNAL OF CLINICAL INVESTIGATION

Vol. 35, May, 1956

* The effect of acute elevation of the plasma chloride concentration on the renal excretion of bicarbonate during acute respiratory acidosis. J. G. Hilton, N. E. Capeci, G. T. Kiss, O. R. Kruesi, V. V. Glaviano, and R. Wégria.—p. 481.
* The effect of glucagon on carbohydrate metabolism in normal human beings. P. K. Bondy and L. R. Cardillo.—p. 494.

Effect of Hyperchloremia on Bicarbonate Excretion. In experiments performed on anesthetized dogs, it has been observed that in acute respiratory acidosis, bicarbonate excreted in the urine decreased and the amount of bicarbonate reabsorbed increased, whereas the amount of chloride excreted decreased and the amount of chloride reabsorbed decreased. The administration of chloride during respiratory acidosis resulted in an increase in bicarbonate excreted and a decrease in the amount reabsorbed. These phenomena suggest the possibility that at least part of the reabsorption of bicarbonate is ionic and not dependent on hydrogen ion secretion by the tubule. This part of the bicarbonate reabsorption is affected by the reabsorption of chloride in such a manner as to suggest competition between the chloride and bicarbonate ions for a common reabsorptive transport mechanism in the tubule.

Glucagon and Carbohydrate Metabolism. Glucagon was given intravenously to normal human subjects. It produced a rapid rise of arterial and venous blood glucose concentrations with increased arterio-venous glucose differences. No change in peripheral blood flow occurred. When given by constant intravenous infusion, glucagon caused a rise of both arterial and venous glucose concentrations with increasing arteriovenous glucose differences, until 1 hr. after which the arterial glucose level fell. Toward the end of the test period (2 hr.), hypoglycemic symptoms often occurred. The falling glucose concentration could not be prevented by larger doses of glucagon. Over the 2-hr. period, serum inorganic phosphate and plasma and whole blood alpha amino-nitrogen concentrations fell steadily. There was no change in blood ketone body concentration. These observations support the concept that glucagon is diabetogenic, since no evidence was obtained of glucose utilization.

JOURNAL OF THE DIETETIC ASSOCIATION VICTORIA

Vol. 9, March, 1956

* The sensory assessment of foodstuffs. N. W. Tschoegl.—p. 1.

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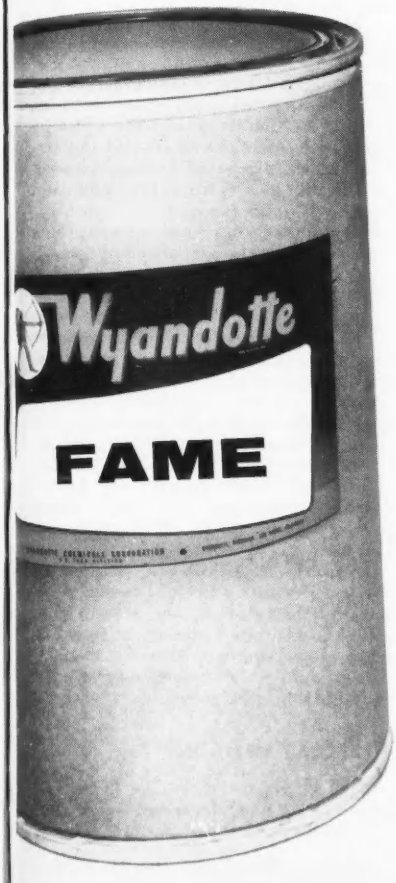

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Sensory Assessment of Foodstuffs. In this article it is pointed out that the difference between physical or chemical measurements and sensory assessments is largely one of the degrees of precision with which they can be made. The human individual or a group of such individuals carrying out sensory assessments are like an apparatus afflicted with relatively large errors of measurement. Testing panels may actually be regarded as the "instruments of organoleptic assessments." Statistics enable us to single out the significant differences. Psychologic errors include the fatigue or the tendency of judgments to become more unreliable and erratic as more and more are made. Two types of testing panels may be the laboratory and the consumer reaction panel. Methods are the single decision tests of identification or acceptance, the ranking test, and the rating test. It is felt that these techniques have a thoroughly sound scientific foundation and have proved a very valuable and often, an indispensable tool in food science and technology.

JOURNAL OF HOME ECONOMICS

Vol. 48, June, 1956

* Whole-egg sponge cakes. A. M. Briant and A. R. Willman.—p. 420.

Whole-Egg Sponge Cakes. Experiments were undertaken to study conditions under which high-quality sponge cakes might be made with unseparated eggs. The following varied procedures were used: salt omitted or added either to the eggs before beating or sifting with the flour, time of beating eggs was either 4, 6, or 8 min., lemon juice added to the unseparated eggs either before or after they had been beaten, sifted flour added by folding it in either with a rubber spatula or with machine on lowest speed. Cakes made with salt added to the eggs before they were beaten had a much lower volume and were less tender than were those with no salt or with salt sifted with the flour. Cakes made with juice added to the eggs before they were beaten were slightly but not significantly more tender than the others. Sponge cakes can be made successfully with unseparated eggs if salt is omitted or added with the dry ingredients, the lemon juice added to the eggs before beating, and the eggs beaten till they form soft peaks.

THE JOURNAL OF NUTRITION

Vol. 58, April 10, 1956

* Studies of protein absorption using nitrogen^{15} as a tag. G. S. Sharp, S. Lassen, S. Shankman, A. F. Gebhart, Jr., and J. W. Hazlet.—p. 443.
* Amino acid requirements of young women based on nitrogen balance data. I. The sulphur-containing amino acids. M. E. Swendseid, I. Williams, and M. S. Dunn.—p. 495.
* Amino acid requirements of young women based on nitrogen balance data. II. Studies on isoleucine and on minimum amounts of the eight essential amino acids fed simultaneously. M. E. Swendseid and M. S. Dunn.—p. 507.
* Effect of choline, methionine and ethionine on fat absorption. H. C. Tidwell.—p. 569.

Protein Absorption. In a study of protein absorption using a yeast protein tagged with nitrogen^{15}, a mean yeast absorption of 90.3 per cent was found among six subjects. Achlorhydria, hypochlorhydria, and age did not appear to produce depressing effects on the capacity to absorb a protein tracer during continued high level protein intake. The single-dose tracer method of determining protein absorption is shown to obviate the need to evaluate endogenous nitrogen.

Amino Acid Requirements of Young Women. The amounts of the sulphur-containing amino acids required to maintain nitrogen equilibrium in eight healthy young women have been determined. When these subjects were placed on a diet containing 7 to 8 gm. nitrogen in the form of peanut protein, plus essential L-amino acids and glycine, the cystine-methionine requirement was 350 mg. or less for five subjects, 450 mg. for two subjects, and 550 mg. for one subject.

Leucine Requirement. Leucine required to maintain nitrogen equilibrium in seven healthy young women has been determined. When these subjects were placed on a diet containing 6 to 7 gm. nitrogen in the form of the essential L-amino acids and glycine, the isoleucine requirement varied from 250 to 450 mg. per day. Three subjects required 250 mg.; three subjects, 350 mg.; and one subject, 450 mg. In the second part of the experiment, the minimum required amount of all essential acids were fed simultaneously to six subjects. The remainder of the nitrogen content of the diet was chiefly glycine. It was found that nitrogen balance was maintained in these subjects for the experimental period of five days with the exception that equivocal results were obtained in one individual.

Choline and Fat Absorption. Because the exact role of the phospholipids in fat absorption is uncertain, a study was conducted to further the findings regarding the effect of choline on the rate of fat absorption. Additional evidence was obtained from the use of methionine, prostigmine, mecholyl, and ethionine to help in determining whether the effect was more likely the result of an acetylcholine-like action or of aiding the phospholipid formation. The rate of fat absorption in albino rats was accelerated when fat was supplemented with choline. Injected choline, as well as various hydrotropic substances, failed to affect the rate of fat absorption, suggesting that lecithin as well as choline is otherwise involved in the absorptive process. Prostigmine and mecholyl supplements also failed to affect the fat absorption rate, indicating that choline does not function in a cholinergic fashion, but may react as a result of increased production of lecithin. A slight effect of methionine supplementation may be ascribed as a result of a failure to supply more physiologic amounts continuously or of a synthetic process too slow to produce sufficient choline to be more effective. Significantly increased blood fat levels after use of ethionine suggests liberation of a considerable amount of free methionine. This might well account for the accelerated rate of fat absorption, if the latter were continuously available in suitable quantities for additional choline and phospholipid formation, which may in some way aid in the passage of fat into the intestinal mucosa.

JOURNAL OF PEDIATRICS

Vol. 48, June, 1956

* The influence of breast feeding on weight gain in infants in the first year. J. Millis.—p. 770.

Breast Feeding and Weight Gain. This investigation has shown that breast feeding results in greater weight gain at twenty-four weeks for poor Indian and Chinese babies in Singapore. No significant difference between breast and artificial feeding was found for wealthier Chinese babies. The weaning diet of the wealthier babies was more adequate and the standard of hygiene was higher; therefore, the artificially fed babies were at no disadvantage. The poor babies received an inadequate diet after weaning, and at twelve months, the benefits resulting from breast feeding were no longer obvious.

LANCET

No. 17, April 28, 1956

* Effects of feeding different fats on serum-cholesterol level. B. Bronte-Stewart, A. Antonis, L. Eales, and J. F. Brock.—p. 521.

No. 18, May 5, 1956

* Vitamin-A levels in idiopathic hypercalcemia. W. M. Fyfe.—p. 610.

No. 19, May 12, 1956

Man's choice of food. J. Yudkin.—p. 645.

Fats and Serum Cholesterol Level. To confirm findings of an interacial survey in South Africa, several different fats and oils were fed under controlled conditions to volunteers, and the effect on serum cholesterol levels studied. Animal fats and hydrogenated vegetable fat behaved differently from vegetable and marine fish and mammal oils. The most likely common difference between these fats and oils is the proportion of unsaturated and saturated fatty acids. Sunflower seed oil and a segregated highly unsaturated fatty acid fraction from pilchard oil consistently depressed the serum cholesterol level when fed alone, with a supplement of cholesterol, or with one of animal fat. The possible application of these findings is discussed, and it is suggested that certain discrepancies in the dietary fat theory of the etiology of coronary heart disease may be explained by variations in the nature of the fatty-acid composition of the fats concerned.

Vitamin A Levels in Idiopathic Hypercalcemia. In eight cases of idiopathic hypercalcemia, the plasma vitamin A levels were estimated before, and 4 hrs. after a standard dose of vitamin A. The vitamin-A metabolism was abnormal in idiopathic hypercalcemia.

MILITARY MEDICINE

Vol. 118, May, 1956

* Refined sugar: Its relation to dental caries. R. J. Fanning.—p. 508.

Refined Sugar and Dental Caries. By reducing the intake of refined cereals and carbohydrates, dental caries can

Meat...

and the Hot-Weather Diet

Contrary to opinion in former years, meat is fully as well suited to the diet in the heat of summer as in the cold of winter.[1] Except for a possibly lessened need for calories and a greater need for water and salt (to compensate for losses in perspiration), the requirements for essential nutrients—protein, vitamins, and minerals—to all intents and purposes remain the same during the hot months as during the cold.

The metabolism of protein supplied by the mixed diet develops less heat requiring dissipation by the body than when the same amount of protein is fed alone.[2,3]

A protein-high diet exerts little if any effect upon work efficiency during hot weather. Meat eaten by workers acclimatized to a hot, humid environment produces no discernible untoward effects.[4]

Meat, providing large amounts of protein similar to human protein in kinds and proportions of contained amino acids,[5] constitutes a year-round food of high nutritional value. It is also a good source of B vitamins and essential minerals—iron, phosphorus, potassium, and magnesium. It is equally nutritious whether eaten hot or cold.

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2. Forbes, E. B., and Swift, R. W.: Associative Dynamic Effects of Protein, Carbohydrate and Fat, J. Nutrition *27*:453 (June) 1944.
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4. Johnson, R. E.: Nutritional Standards for Men in Tropical Climates, Gastroenterology *1*:832 (Sept.) 1943.
5. Berg, C. P.: Utilization of Proteins, J. Agr. & Food Chem. *3*:575 (July) 1955.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

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virtually be eliminated. However, one must not dismiss other contributing factors, such as heredity. The diet aimed at reduction of lactobacilli by means of a restricted carbohydrate diet is a rather strict diet, and the majority of patients will not follow it exactly. A modified diet might be better because individuals will follow it longer. It allows some refined sugars at a time when brushing of teeth immediately afterward is possible.

NEW YORK STATE JOURNAL OF MEDICINE

Vol. 56, May 15, 1956

The challenge of obesity. W. Dorfman.—p. 1642.

NUTRITION REVIEWS

Vol. 14, June, 1956

* The castaway at sea. A. V. Wolf.—p. 161.
* The obese child. Clinical Nutrition.—p. 172.
* Water and salt absorption in the sprue syndrome. Clinical Nutrition.—p. 173.

Obesity from high fat diets. Experimental Nutrition.—p. 189.

Drinking Sea Water. A biologic objection to sea water drinking has been derived from consideration of the aquatic marine mammals. Seals and whales, for example, avoid the ingestion of more than small quantities of sea water. If they don't see fit to drink it, the argument goes simply, man had better not. It is known that the seal gets its water from food. Although the Navy admonishes on the sea water desalting kit not to drink sea water, it is noted that the potable water prepared with the standard silver zeolite briquets is practically a 1:9 admixture, or 10 per cent sea water. Research during World War II suggested not only that urinary water excretion was less when some salt was ingested, but the salt hunger of starving men taking only fresh water was mollified.

The Obese Child. Findings are presented, with the deductions: that childhood obesity is usually acquired, although abnormal appetite-regulating mechanisms are not ruled out; that obesity and abnormally great height of the obese child are related to overeating and not to endocrine factors; that the earlier onset of puberty in the obese child can probably be correlated with the faster growth of these children in other parameters and does not indicate endocrine abnormality. Endocrine insufficiency is not suggested.

Water and Salt Absorption in the Sprue Syndrome. The studies listed suggest that the sprue syndrome involves multiple defects of absorption and that the term "malabsorption syndrome" describes the disease. In one study patients with the sprue syndrome exhibited nocturnal diuresis of a water load. They claimed that water absorption was delayed only if food was in the intestine, the presumption being that the water was osmotically obligated and absorption thus delayed. In another study, 50 microcuries of radioactive sodium chloride were injected into the second and third parts of the duodenum, and absorption into the blood stream was measured. Six patients with severe steatorrhea demonstrated a delayed rise in the counting rate over the hand. Two with less severe disease had normal absorption of sodium. Two of the severe cases were re-examined after clinical recovery, and the sodium absorption had become normal.

PUBLIC HEALTH REPORTS

Vol. 71, May, 1956

* Association of vitamin B_6 deficiency with convulsions in infants. E. M. Nelson.—p. 445.

Acute and subacute toxicity studies of sodium fluoride in animals. N. C. Leone, E. F. Geever, and N. C. Moran.—p. 459.

* Nutritional knowledge and practices. C. M. Young, K. Berresford, and B. G. Waldner.—p. 487.

Vitamin B_6 Convulsions in Infants. One way in which the Food and Drug Administration protects the consuming public is by monitoring the recovery from trade channels of any product, food, drug, or device that is found unsafe for use. In 1953, such a program related to the occurrence of a series of cases of convulsions in infants who had been maintained on a liquid formula. The majority of cases of convulsions occurred in rural areas rather than in large cities where the large proportions of infants are under the care of pediatricians. The prevailing practice by many pediatricians of supplementing liquid formulas at an early age may not be followed in some rural areas. More than a hundred cases of vitamin B_6 deficiency occurred in this country before the condition was recognized as a deficiency disease. With constant improvement in food processing, acceptable methods are needed for determining the nutritional adequacy of infant foods. For products in which the lactose is increased to simulate mothers' milk, the classical biologic test with the rat is impracticable because of intolerance to lactose. The company manufacturing the product added vitamin B_6 to the product and returned to its original formula. It would be helpful if there were prompt reporting to the Food and Drug Administration of the occurrences of unexplained disease conditions or unusual reactions, particularly where associated with the use of a particular food or drug is suspected.

Homemakers' Nutritional Knowledge and Practices. This is a summary article of the series of four papers which appeared in the March, April, and May issues of this JOURNAL, titled "What the Homemaker Knows about Nutrition."

SCIENCE

Vol. 123, May 25, 1956

* Factors in human milk interfering with influenza-virus activities. R. K. Silver, G. Braun, F. Zilliken, G. H. Werner, and P. Gyorgy.—p. 932.

Vol. 123, June 1, 1956

* Serum protein concentrations in the North American Negroid. H. M. Rawnsley, V. L. Yonan, and J. G. Reinhold.—p. 991.

Vol. 123, June 15, 1956

* Relation of aromatic amino acids to excretory pattern of schizophrenics. P. L. McGeer, E. G. McGeer, and J. E. Boulding.—p. 1078.

Antiviral Activity in Human Milk. In the conclusion of this study, it appeared that the copper ion in human milk interferes, even in extremely low concentration, with the multiplication of influenza virus in the chorioallantoic membrane. The antiviral activity of fractions obtained from human milk was the result of contamination with the copper ion. The presence of normal hemagglutinin-inhibitor in human milk was demonstrated. It was the recognition of mucoproteins and the isolation of nitrogen-containing saccharides in human milk that stimulated the study of human milk as a source for factors with antiviral activity.

Serum Protein Concentrations in the Negro. It is suggested by the results of this study that the differences shown by the North American Negroid population are large enough to require the use of separate standard values when gamma globulin and other serum protein measurements are made. The subjects were all voluntary donors who came from localities in which both Negroids and Caucasoids were living in similar environment in a region where there is no general malnutrition or endemic disease. No abnormalities in liver function were detectable. It is suggested that the higher mean concentrations of gamma globulin found in Negroids may be the result of a genetic factor.

Relation of Aromatic Amino Acids to Excretory Pattern of Schizophrenics. In this paper the hypothesis is offered that schizophrenic hallucinations may be of biochemical origin. Four male chronic schizophrenics were observed where the pre-diet chromatograms of the urine showed a greater than normal number and intensity of spots. The chromatograms after the test diet which was lacking in phenylalanine, tyrosine, and tryptophan, showed a reduction in the number and intensity of spots to normal or near-normal range. The results of the control diet which contained all the aromatic amino acids showed no such decrease in color. Color after the test diet dropped sharply at first but, after about sixteen days, some color began to reappear. There were no definite conclusions on the diets where only tryptophan or only phenylalanine and tyrosine were lacking. No physical change was noted during the experiments. All the patients were chronic cases with well-established abnormal behavior patterns. It is pointed out that, by the chromatographic work, there is an alteration, physiologically, in schizophrenia which can be controlled by means of a suitable diet.

THE SCIENTIFIC MONTHLY

Vol. 82, May, 1956

* Acid-base terminology. T. P. Nash, Jr.—p. 255.

Acid-Base Terminology. Much confusion and misunderstanding in discussion of the alkaline reserve and acid-base of biologic systems would be avoided by adopting and employing a consistent and precisely defined terminology. Since the alkaline reserve and acid-base balance may vary independently of each other, and even in opposite

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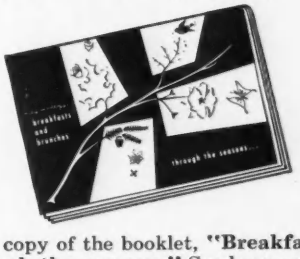

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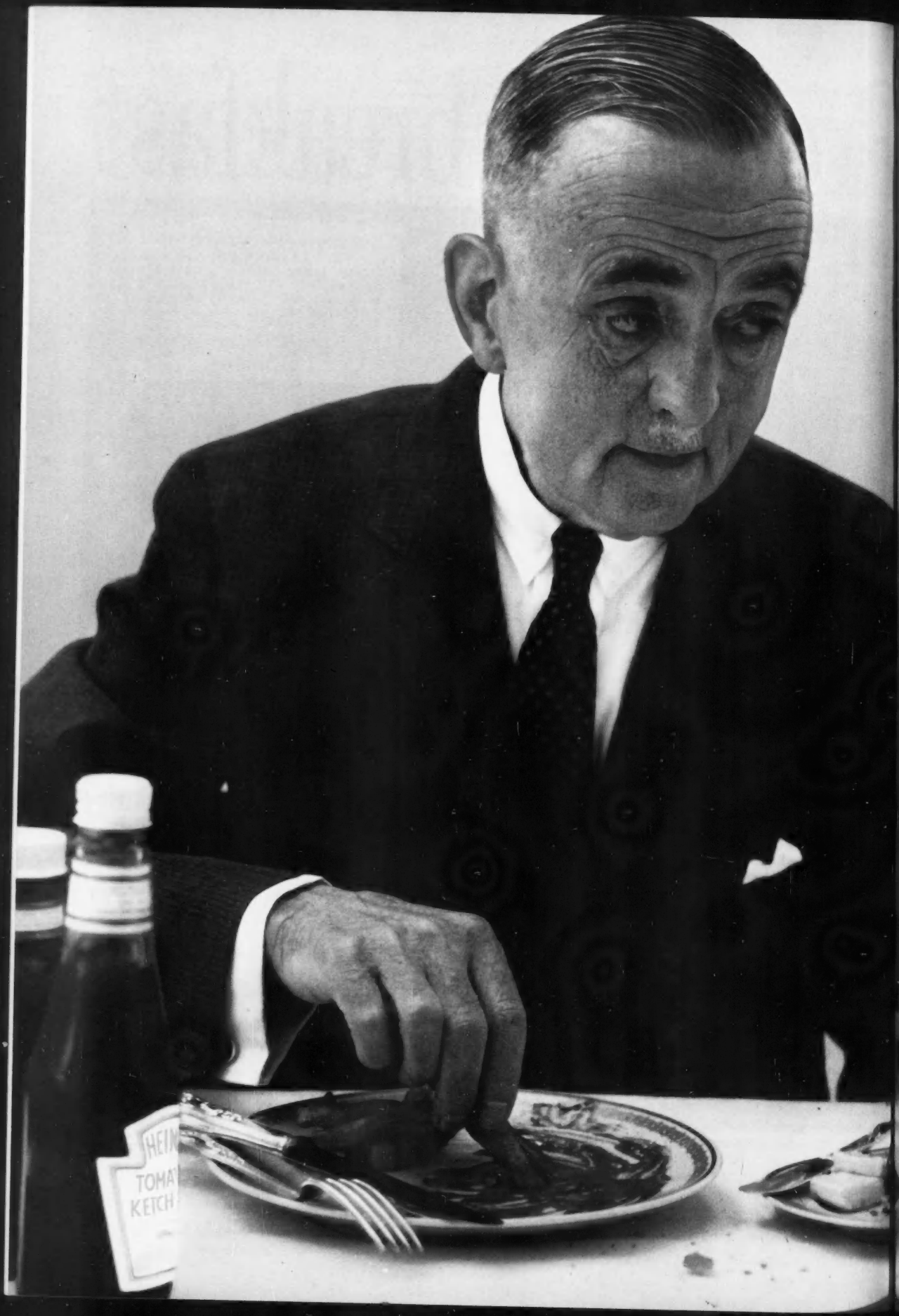
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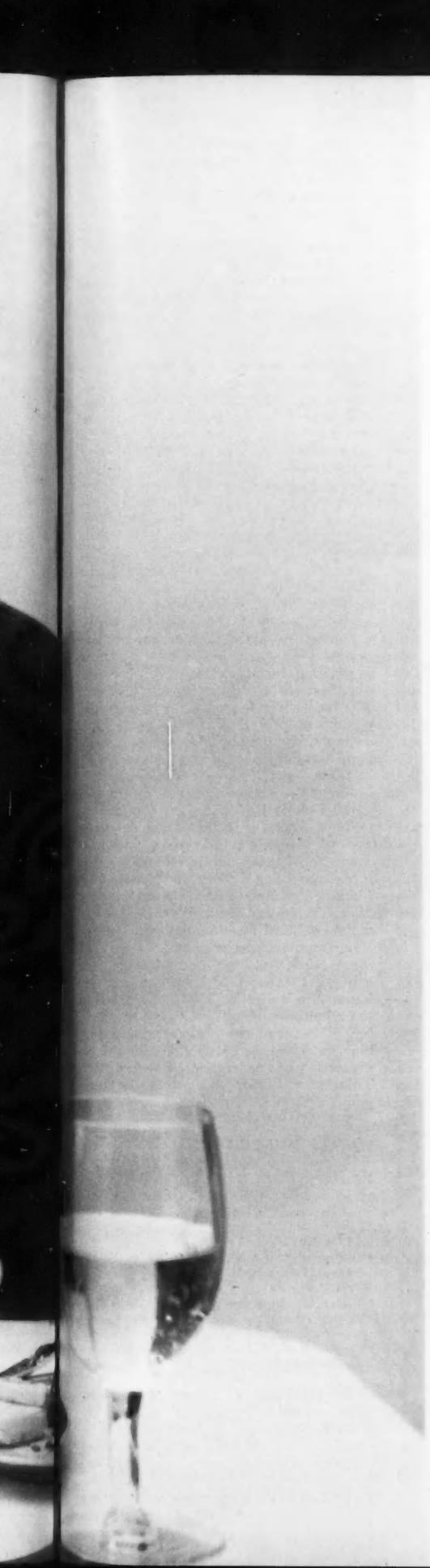

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directions, they cannot be described in the same terms. It is proposed that the alkaline reserve be described in terms of normal, acidosis, and alkalosis which have reference to the carbon dioxide capacity of the venous plasma. It is proposed, further, that the term acid-base balance designate only the molecular ratio existing between the bicarbonate and carbonic acid components of the venous blood plasma and be expressed as the *p*H of the plasma. It is suggested that the terms "acidemia" and "alkalemia" be employed to describe the acid-base balance when the *p*H is respectively numerically smaller or larger than normal.

SOUTHERN MEDICAL JOURNAL

Vol. 49, May, 1956

* Present outlook of patients with recently acquired diabetes. K. M. West.—p. 468.

Outlook in Recently Acquired Diabetes. The life expectancy of the carefully managed person with diabetes with onset in later or middle life is now only slightly below normal, and the modest impairment of longevity is principally due to excessive coronary atherosclerosis. The life expectancy of the young diabetic person treated with average efficiency is about half of normal and is impaired principally because of glomerulosclerosis. There is some indirect evidence suggesting that careful control of glycemia may delay the development of atherosclerosis, but this has not been proved. Evidence is presented to support the opinion that the longevity of young diabetic persons is substantially improved when exceptionally good initial education and management permit continuous control of glycemia.

ADULT LEADERSHIP

Vol. 5, June, 1956

* Why people take leadership. J. K. Hemphill.—p. 44.
* The two tasks of leadership. M. Lieberman and D. Stock.—p. 49.
* The leader you elected. R. B. Cattell.—p. 54.
* Understanding and helping your group. N. L. Gage.—p. 57.

Taking Leadership. Results of four experiments among college students reveal that many of the reasons for attempting leadership lie in the characteristics of the situation in which the person finds himself. He will try to lead if he recognizes himself as the "expert" in the group. The demands that the task imposes for organizing and planning produce an incentive for attempting leadership. Certain tasks require little in the way of coordinated effort while others are impossible to accomplish until someone initiates a plan or course of action. Whether a person will attempt to lead depends on how his previous efforts have been received by others in his group. People are apparently quite sensitive to how well their attempts to lead are accepted, and it appears that acceptance can make a leader of almost anyone. A person will lead if the group's task is important to him and when he sees that leading can contribute to a solution of the group's task. Thus we attempt or do not attempt to lead for many reasons and it is clear from the evidence reported that there are other and more acceptable motives for attempting to lead than the desire for personal power.

Tasks of Leadership. This article explores some conceptions of leadership which stem from the Harvard laboratory of Robert F. Bales. Leadership behavior is not generally or automatically the province of a single person. It is often divided among at least two different types of specialists: the "task" specialist and the "socio-emotional" specialist. The first focuses on the task-problems of the group. It is he who contributes the most ideas and keeps the group working toward its official goal. The second works toward maintaining unity and good relationships among members. Under conditions of dual leadership, both the task specialist and the socio-emotional specialist are in reality leaders, and each complements the other and is important to the stability of the group. Bales conducted experimental work on the frequency with which these functions are divided between different people and whether they can be performed by one person. Tentative findings indicate that there are persons who manage to maintain high participation, high task ratings, and proportionately high liking ratings but such persons are rare; that the man who is judged by the group members to have the best ideas is not generally the best liked—a separation which becomes more marked with time. Thus there are apparently few men who can hold both roles, and the tendency is for these positions to be held by two different people. The two are combined only about as often as one would expect by chance. Why is it that a man who is admittedly helping the group solve its task problems may fail to be proportionately well liked? It may be that the man who presses to get the job done may be identified by others as representing the demands of authority in general; those people who fail to elicit as much liking as one would expect in proportion to their task contribution are not only very high participators, but they also have a low ratio of remarks addressed to them. In a word, they "talk too much."

Profile of Leadership. The elected leader and the real leader of a group may be two different people for there are two concepts of leadership: (a) the popular, elected leader and (b) the effective leader who contributes most to the group goal. Personality studies made of leadership found that those who became leaders in either sense have certain things in common. They are, compared with nonleaders, more intelligent, enthusiastic, conscientious, bold, less given to feelings of insecurity, stronger in will control, and less subject to anxiety or tension. Effective leaders are significantly more intelligent than elected leaders, and they tend to show in a greater degree the leader's freedom from neurotic anxiety, his strength of will, and his independent boldness. The elected leaders are significantly more talkative and sociable, show more impulsive emotionality and happy-go-lucky serenity in difficult circumstances. They are in general less readily inhibited and have had a less punishing life experience than individuals who fall into the "effective leader" classification. Thus, in terms of becoming known and elected, talkative and sociable qualities are advantageous, though they do not favor thoughtfulness and sensitivity in solving problems.

Understanding the Group. Accuracy in understanding how a group thinks and feels about various matters should lead to more effective leadership but only insofar as the perceiver also has appropriate motivation, abilities, and freedom to adapt, and insofar as his accuracy is with respect to relevant matters. There are at least three ways to acquire accuracy in understanding: sensitivity, opportunity, and influence. By sensitivity is meant a skill, acuity, or "empathic ability" to observe facts about people and draw the proper inferences. The second is the "switchboard operator" conception of how some people get to be accurate in their understanding of others: they simply find themselves in a position in which more information about group members comes to them. The leader who is seen as the proper recipient of gripes and suggestions, for example, has the opportunity to become more accurate in his perceptions of group members. Finally, we can conceive of leaders as becoming more accurate through the influence they exert on group opinion. Here we refer to the leader's authority in his relationships with his group. If his accuracy in perceiving the group's opinion before the group has discussed an issue and again after some discussion is compared with that of other members, it will be found that his relative accuracy has improved. It will be found also that the group has moved somewhat toward his position on the issue. The leader, both before and after the discussion, tends to "assume similarity" between the group's opinion and his own. Then the group's opinions after discussion do become more like his own. This makes him more accurate as compared with other members.

FOOD ENGINEERING

Vol. 28, May, 1956

* Irradiation and antibiotics may team up to preserve meat. FE Staff.—p. 57.
* Concentrated milk, frozen desserts, special problems.—p. 86.
* Two readers take exception to points on dietetic foods. Letters to the Editor.—p. 99.

Vol. 28, June, 1956

* Black light: Super sleuth.—p. 52.
* Fireless smokehouse smoker—its advantages—how it works. FE Staff.—p. 65.
* Skillful processing broadens whey solids uses: Ingredient uses mounting. J. V. Ziemba.—p. 76.

Highlights in Meat Research. Two methods for prolonging shelf-life of meat may team up. A combination of irradiation and antibiotics is being investigated and shows reasonable promise. Freeze-dehydrated meat has been termed superior to meat dried by other

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means; undesirable flavor and texture are avoided, and the meat has better storage stability than air- or vacuum-dried meat. The application to meat of nuclear magnetic resonance (NMR) to measure moisture has not yet been made, but recent work has shown the possibility of measuring moisture, fat, and other hydrogen-containing constituents—also the possibility of measuring amino acids and other nitrogen-containing constitents—by means of NMR of nitrogen. . . . Superior baking characteristics of rearranged lard are attributable to the occurrence of a proper assortment of intermediate-melting triglycerides which, in conjunction with flakes (highly hydrogenated triglycerides), produce a degree of air dispersion in batters conducive to high cake volume. . . . . Irrespective of amount of air incorporated, greater cake volume appears to be directly proportional to degree of dispersion of air bubbles, both in plasticized fats and their respective batters. . . Many additive materials have been proposed and a number are now being used in meat processing. Several of these increase moisture-holding capacity and reduce production costs. Others are used for better color, flavor, texture, or improved stability. Imitation smoke flavor and smoke distillates are being used experimentally and, in addition to adding flavor, have antioxidant properties. In unsmoked sausage, certain synthetic antioxidants may be used to increase product stability.

Dairymen's Conference. Fresh concentrated milk is now being successfully test-marketed and the stage has been reached where commercial production is feasible. Top quality milk is utilized and concentrated to one-third its original volume by means of special equipment. Key to the making of a product with improved flavor and keeping quality has been the technique of increasing the heat treatment, according to research conducted at the University of Wisconsin. Research is also continuing there on frozen concentrated and sterile concentrated milks. Big problems with the frozen concentrate are flavor and stability. Age-thickening, or gelation, is the biggest of the stumbling blocks. With reconstitution after only two weeks' storage, a curd drops and whey rises. Sterile concentrated milk is as acceptable as fresh whole milk and can be kept six months without refrigeration. Seen feasible, through use of ultra-high temperature, short-time pasteurization employing a new heat exchanger, is once-a-week delivery of fluid milk in large containers, such as 3-gal. units. Big hurdles in making low-fat frozen desserts are machinery limitations and mix formulas. Regular corn sirup is recommended over Hi-conversion corn sirup or corn sugar. A single formula has been developed at the University of Wisconsin for making soft-dispensed and packaged, hardened products. This formula calls for 6 per cent fat, 12 per cent serum solids, 13 per cent sugar, 8 per cent corn sirup solids, 0.4 per cent stabilizer, and 0.1 per cent emulsifier. Ices and sherberts are "door-openers" in gaining new customers, but these products must have high quality flavors, (preferably fruits), eye-appeal, smooth texture, controlled overrun (30 per cent), retained firmness, and neat packaging. Overfreezing results in a "crumbly" sherbert.

Dietetic Foods. Two letters which take exception to points made in a recent (March) article on dietetic foods by J. J. Alikonis appear in "Letters to the Editor," with a letter from the author defending his points. Mr. Alikonis' remark that "carbonated beverages in which sorbitol or artificial sweeteners are used in place of sugar are not, strictly speaking, low in calories," is questioned. The author replies that his reference was to beverages in which sorbitol or artifical sweeteners are used in place of sugar (sucrose) only—not to beverages made for the diabetic field containing no sugar whatsoever; that sweeteners such as corn sugar, corn sirup, and honey, are used with only a small reduction in calories, yet these beverages are advertised as being calorie-controlled and containing less calories than ordinary soft beverages. To the author's statement that aerated confections are low in calories "because their bulk has been increased by aeration," the reader argues that the statement is misleading; that aeration will reduce the calorie content per unit volume but calorie content is generally stated on a weight basis—that actually the somewhat lower calorie content of marshmallows, nougats, and frappés as compared with that of many other candies, is due to their lower fat content and higher moisture content—not to aeration. Mr. Alikonis replies that the same effect is obtained from a product whether you add an additional 20 or 30 per cent of a bulking agent (without calories), or actually aerate the product and give it an extra volume of 20 to 30 per cent—that the reader is correct in his statement that most marshmallows and frappés, and some special nougats, are lower in fat content but adds that actually the higher moisture content has more to do with the lower calories on a weight basis and that the amount of calories on a volume basis should be credited to aeration. The charge is made that his views on low-calorie foods in general, i.e., that "anyone buying low-calorie foods is actually admitting lack of will power," and the prediction that "laws will be passed stipulating that no dietary food can be marketed unless it has the nutritional quality suitable for the general public" are "unfortunate" attitudes toward low-calorie foods. Mr. Alikonis replies that "any low-calorie food or reducing plan that is not nutritionally balanced is dangerous to health if nutritive requirements are not met. He questions the wisdom of promoting food that contains artificial sweeteners in which there is only meager saving of calories whereas the same results could be obtained by eating 10 to 20 per cent less food.

Black Light. Black light, a term to designate long wave ultra-violet radiation, is illuminating many a food-processing sore spot. By installing special black light fixtures above egg-breaking tables, it is possible to eliminate completely pseudomonas organisms which show a brilliant green under the ultra-violet rays. It is possible to detect minute traces of milkstone on equipment, pipelines, and containers: clean equipment has a dark-violet color under the light while milkstone shows a yellowish to blue-white color. Bruise and rot spots on citrus fruits which pass visual inspection are easily revealed by black light. In the case of seafood, fresh shrimp fluoresce a purple-blue which changes to white as spoilage develops. Shell particles fluoresce blue-white. Black light will also detect parasites in fish fillets. Ultra-violet rays are used effectively to detect adulterations and impurities in food products. In coffee, for example, chicory fluoresces yellow-white and taraxacum root shows a blue color. Black light also distinguishes between virgin and refined olive oils, and mineral oil is easily spotted when mixed with vegetable oils. Contaminants in flour appear dull violet. Dried rodent urine stains fluoresce more-or-less blue-white on cloth bags and similar containers. Through color changes, stale foods are also easily detected. The ultra-violet lamps are valuable in testing dishwashing machines or even manual operations for cleanliness. An additive is used and dishes are washed as usual, rinsed, and scrutinized under the lamp. Clean areas show up as dark red or bluish purple and organic matter becomes fluorescent. Leaks around kettles or ingredient reservoirs can be discovered by filling with water and the additive. After standing, leaks are detected instantly. Black light is not infallible and much of its success depends on the skill of the operator, but its place in the food industry is certain to grow.

Fireless Smoker. A new kind of smoke generator has been devised which produces smoke through the abrasion created when a weighted wooden log is brought vertically into contact with a horizontal high-speed rotating metal disk. Amounts of smoke can be controlled: the greater the weight applied upon the top of the log, the more smoke. With this fireless generating system installed, an operator can actually walk into a smokehouse with little, if any, smarting of the eyes. There are no messy accumulations of tars and resins requiring periodic removal. A twenty-one-cage, single-story smokehouse can be filled with smoke in 3 min. The system is easily maintained and manual cleaning of the automatic log-type unit is unnecessary as there is a built-in water-cleaning system. Constant dry smoke is generated into the smokehouse and there are no humidity variations traceable to differences in wet- or dry-burning sawdust. There is no "heat" to the smoke, which is water-spray-washed to the same temperature as the water.

Whey Solids. Whey and nonfat dry milk are now commonly used in cheese foods and spreads, where they furnish valuable nutrients and restore some important milk solids lost in cheese-making. The whey product aids in giving soft-body characteristics to cheese food and products; dry whey adds a pleasant and distinctive flavor of

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its own, accentuates cheese flavors, and maintains tastes of other optional spread ingredients. Whey solids also benefit the baker for they impart a shortness of crust and a golden brown color to baked goods. The ingredient's high lactose and balanced protein reduce shrinkage of baked goods and extend shelf-life. Whey solids, when used in cookies, crackers, coatings, and fillings, contribute to flavor by intensifying rather than masking tastes. They also add to the color and "bloom." Whey products are rated as a neutral-to-slightly tenderizing cookie agent and also maintain the viscosity of doughs, batters, and coatings. When used in confections, whey solids accentuate added flavor and extend shelf life. They have also been found to have definite advantages over nonfat milk solids in making sherberts and ice cream, and are used to advantage in the manufacture of soups and comminuted meat products.

HOSPITAL MANAGEMENT

Vol. 81, June, 1956

* Morning lift; early bird coffee service cheers patients. A. S. Lane.—p. 8.

Early Bird Coffee Service. A familiar sight in the early morning, prebreakfast hours at Point Pleasant Hospital, Point Pleasant, New Jersey, is a streamlined, light-weight coffee cart operated by a nurse's aide. The operator of this mobile canteen begins the preparation of coffee and stocks up with sugar, matches, cigarettes, and any other supplies she may need at 4:30 A.M. At 5:15 A.M., she starts her rounds—waking each patient in as painless a manner as possible. If coffee is desired, she serves it exactly as the patient requests. When finished, the paper utensils are easily discarded. Requests for cigarettes are also complied with. Patients booked for surgery or other procedures which inhibit the taking of fluids are so designated by a 3 by 5-in. card on the door or bed. In the afternoon and again in the evening, cold drinks are transported to the bed- or chair-side. The mobile canteen also serves in several other roles of importance. It is parked at central locations to provide the nursing staff, medical staff, and other personnel with a mid-morning coffee break. Thus the hospital feels that this investment has paid well in cheer both to patients during the boring and depressing hours before breakfast and to hospital staff who are provided a morning lift.

HOSPITALS

Vol. 30, May 1, 1956

* How to make nutrition education effective. III. For students, interns and residents. M. N. Lewis.—p. 70.

Vol. 30, June 1, 1956

* Children will eat hospital food. L. Weng, M. Heseltine, and K. Bain.—p. 64.

Nutrition Education for Hospital Staff. The Ohio State University Medical Center provides time-saving dietary conferences during the noon hour for medical students, interns, and residents who wish dietary instruction. Most nutrition classes are of the lecture-demonstration type. Food is the best illustrative material, i.e., seeing and tasting liquids helps the students reach agreement on what to include on the surgical liquid diet. Eating a diabetic diet that they have prescribed and planned reveals to them the importance of adapting the diet to the patient's needs and eating habits. The student may remember little of what the instructor said but he remembers what he ate. Interns and residents frequently review a patient's problems and reinterpret them in terms of the meals demonstrated during the lunch-hour conference. The "chalk talk" dramatically shows the contribution of the commonly used foods to the recommended allowance for each nutrient. As a menu pattern is developed to insure inclusive and proper distribution of food intake, colored chalk is used to fill in the percentage of the recommended allowances contributed by each food. The importance of milk for riboflavin, meat for niacin, and citrus fruits for ascorbic acid is thus graphically demonstrated. The information needed to write diabetic diet prescriptions is briefly reviewed. The student then develops a prescription for himself and plans his diet from the foods allowed and eats the diet he planned. Patients profit from this instruction, for the doctors become more aware of the importance of keeping the patient in good nutritional condition and of individualizing the diet to his food habits. The dietitian is less plagued by impossible or unnecessarily rigid diet orders. Also, doctors more frequently call on her for consultation.

Feeding Hospitalized Children. For pediatric patients, it is wise to provide the full quantity of foods needed by healthy children of the same age range and modify the kinds and amount served to the individual child in accordance with his special requirements and his ability to eat the food. These are some common conditions which must be considered: diminished muscular activity, increased basal metabolic rate, severe burns, and pronounced undernutrition. During prolonged immobility, there is a tendency toward impaired metabolism of protein and calcium. Thus it is necessary to supply more foods which are rich in calcium and protein than are usually required. Conditions which boost the metabolic rate result in an increased need for energy foods and certain vitamins. Severe burns call for very high levels of protein intake. Undernutrition must often be treated immediately on admission. Feeding problems of children are especially numerous. Unwillingness to eat may be an inevitable aspect of the disease, but it is important to make sure that there is no controllable factor responsible. Faulty eating habits may complicate the situation. Or, it may be difficult for the sick child to take food, and unfamiliar items may impair his appetite. On the other hand, some children take an excessive interest in food. Infants may regress to taking only a bottle, but such regression will be temporary if the baby has good care. Those responsible for child feeding must adjust the administration and type of food service to the child so that his nutritional needs are met in spite of many complications. Children *will* eat if the dietitian tailors the menu to their needs.

THE HOTEL MONTHLY

Vol. 64, June, 1956

* Labor-saving possibilities of processed foods. H. M. Albert.—p. 44.

Processed Foods to Save Labor. With today's labor market as it is and less personnel being trained for responsible positions in the food service industry, it is almost impossible always to guarantee an efficient staff. One solution is to make processed foods the backbone of your menu planning. Processed foods come in easily stored units, usually take up less space than fresh produce or the individual ingredients used to produce such items, and ready-to-serve or near ready-to-serve foods reduce to a minimum the chances of error in preparation. Also, the problem of quantities to buy is easily solved since yield of processed foods is pre-determined by the manufacturer. Menus built around the four entreés illustrated in this article are featured.

INSTITUTIONAL FEEDING AND HOUSING

Vol. 6, June, 1956

* Mechanized methods cut production and serving costs. R. Howard.—p. 20.
* What you should know about cabinet-type freezers. —p. 29.
* How to protect your money.—p. 32.
* Insect control is a management problem. J. V. Cawley.—p. 38.

Mechanized Methods to Cut Costs. New equipment and a modified layout transformed a thirty-year-old kitchen into an efficient, compact production area. Prior to remodeling, the hospital operated its kitchens by a decentralized system. With the advent of the new food conveying system and kitchen layout, operations now are based on a serving system using heated-refrigerated tray carts which transport complete meals directly from the kitchen to patients' rooms. Large floor serving pantries have been eliminated. All dishwashing for patients and the employees' cafeteria is now carried on in a compact new dishwashing room adjoining the kitchen and cafeteria. This new system provides for serving all patients' meals, both regular and modified, under the watchful eye of the head dietitian so that portions and quality are checked more accurately. Food waste is reduced to a minimum, and total time required for serving and clean-up has been reduced. The new layout emphasizes the kitchen as a complete unit. Each department is dove-tailed so that food moves directly from receiving through the various steps of preparation to the tray assembly counter and on to the patients and personnel. Department partitions were removed to facilitate cleaning, allow better light and ventilation, and make communication and supervision easier.

LILY CHINA-COTE NESTRITE

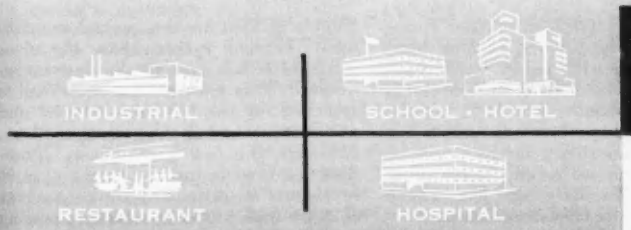
serves hot drinks in the best of taste!

If you are proud of the coffee you serve, you'll be interested in the new Lily* China-Cote Nestrite — a revolutionary new cup that preserves the *true* flavor of coffee and all other hot beverages.

With China-Cote, the inside of the cup remains white and glossy — coffee never penetrates its special "china-like" coating. And China-Cote means a hotter cup of coffee for patients and staff. Compared with regular coffee containers, China-Cote retains as much as 10° more heat ten minutes after pouring.

China-Cote has extra rigidity — never gets soggy. The rim is smooth and pleasant to drink from . . . and the handsome, modern design adds to the taste-appeal of any hot beverage — whether it's coffee, tea, hot chocolate or soup. Perfect for use as a cup or carry-out container, China-Cote sets a whole new standard of hot-drink enjoyment.

Learn more about the many advantages of China-Cote — the cup that does so much more for so little more. Fill out and mail the coupon today.



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ADA 7

This new food service layout is graphically presented in a series of pictures and a chart showing locations of all stations and equipment.

Cabinet-Type Freezer. Many new frozen products are not being packaged for institutional use. As a result, the supplementary cabinet-type freezer (12 to 20 cu. ft. capacity) has become a necessary piece of equipment in volume operations. The author offers a buying guide to help select the proper freezer with the right features.

Protecting Your Money. A safe can pay for itself. The reduction of burglary threat, plus lowered insurance rates, makes a safe a sound investment. Here is a double check list suggesting some rules which will thwart burglary and hold-up attempts.

Insect Control. The most important rule to follow is to take positive action to deprive insects of a home. It is inexcusable for a food service establishment to permit uncovered garbage cans, improperly cleaned floors and walls where food particles can lodge, or unnecessary openings in any surface which will enable an insect to gain entrance. Despite efforts to make pests unwelcome, insects *will* gain entrance and insecticides may be employed. However, such means should be under management's control and used only as a last resort. Insecticides intended for use in food service operations must be approved specifically for that purpose. Although there is no such thing as an insecticide with no toxicity, there are formulations on the market which have received a U.S.D.A. registration as non-toxic, which means they are harmless to humans and warm-blooded animals if used as directed. These are usually composed of pyrethrins, synergists, and petroleum distillates containing antioxidants to prevent deterioration. Ask the following questions when buying insecticides: (a) Are the active ingredients effective against flying and crawling insects? Why is the proportion of synergist such and such in relation to the pyrethrin? (b) Is the formulation registered by the U.S.D.A. as one that is non-toxic to humans and warm-blooded animals when used as directed? (c) Will it stain fabrics, wall paper, or painted surfaces? (d) Will it contaminate closed packages of food materials? (e) Will it corrode metals? (f) Does it have an objectionable end odor? There are insecticides available which are particularly effective as residuals but are more toxic to human beings than pyrethrin-based insecticides. A number of insect-bait preparations have also appeared on the market. The bait is placed in strategic spots outside an establishment in the hope that the insects will walk on or eat the poisoned preparation.

INSTITUTIONS

Vol. 38, June, 1956

* Steam for dishwashing. A. M. Macfarlane.—p. 49.
* Making ice cream mix.—p. 106.
* Need training and management; can't have one without the other.—p. 131.

Steam for Dishwashing. Steam used in dishwashing equipment performs two essential and definite functions: (a) It heats and maintains the proper recirculating tank temperatures in the scrapper, wash, and rinse tanks; and (b) It maintains the final rinse water at a uniform temperature of not less than 180°F. Steam is employed in the dish machine in one of the following ways: (a) Steam coils which are immersed in the tanks and transfer their heat directly to the water being heated. After the steam has completed its cycle, it is condensed, returned to its source, and used again. (b) Steam injectors are fitted into the recirculating wash and recirculating rinse tanks. Live steam passes directly into the tank water. (c) Thermostatic condensate control valves are supplied to maintain a desired temperature and to conserve the steam supply. (d) Steam booster heaters are mounted on the dishwashing machine or adjacent to it to maintain the final sanitizing rinse at the proper temperature. The steam requirements for a specific installation will depend on the number of meals served, the type of tableware used, the size and type of machine, and the temperature of the building water before it is boosted. This specific amount required can be ascertained from the local manufacturers' representative. By adding together the steam required for dishwashing, food preparation, and cleaning, a steam boiler can be selected having adequate capacity for the total job. In selecting such a boiler, consideration should be given to the fact that no engineer is required on the premises unless the steam pressure exceeds 15 lb. per square inch. Various models of dishwashing machines are illustrated.

Ice Cream. A section is devoted to ice cream desserts and contains a wealth of information on composition and preparation of ice cream, freezing, storage, cleaning and care of equipment, and enticing frozen ice cream recipes. Included among these recipes, which are gathered from successful food service operators, are these intriguing items: "The Fairy Princess," adapted from an old German recipe; "The Snow Princess"; cranberry orange ice cream pie; orange Alaska surprise; green crème de menthe parfait; peanut vanilla roll with butterscotch sauce; chocolate-marshmallow-walnut ring with chocolate sauce; ritzy pie à la mode; ice cream crepes surprise; mocha ice cream meringue pie with Graham cracker crust; omelette surprise jubilee; rainbow blossom ice cream with pecan shortbread; chocolate-coconut-peppermint ice cream pie; fresh coconut snowball, candle bright; Georgian Room chocolate ice cream bars; strawberry tartlet princess; sponge cake for ice cream; baked pineapple, Antarctic; ice cream loaf flambé Ninon; and white Christmas sundae.

Training and Management. These two words go hand-in-hand. You cannot have one without the other. There is no such thing as a "utopian" worker. Progress comes from rigorous management efforts applied to the currently available employees. It comes from a continuous, comprehensive training program which goes on at all times and at all levels. Managers, too, must undergo an intensive training program closely supervised by management. The capabilities and the qualifications of managers (or lack of qualifications) account for over 80 per cent of restaurant failures. Of importance today is the position of the vocational school which gives serious, professional-type of training. The students of these schools are readily accepted by industry as entrants into jobs of cooking and baking. They are not considered skilled workers, but they are given preferential treatment in job placement because industry feels that the training the students have picked up in the vocational schools reduces the training time required by industry.

THE MODERN HOSPITAL

Vol. 86, June, 1956

* Special nourishments pose special problems. R. F. Binnig.—p. 108.

Between-Meal Nourishments. One method of control of special nourishments is a central nourishment kitchen. Lankenau Hospital, Philadelphia, first placed such an operation on a trial basis. All nourishments were removed from floor kitchens, and the nursing personnel was taught the new method of requesting nourishments. Today this innovation is a permanent feature of the dietary department. The central nourishment kitchen is operated on a 24-hr. basis, and all nourishments are prepared there. During the day and evening shifts, one person is assigned full time to the central kitchen, while the night coverage is handled by the regular dietary personnel. As a patient is placed on a modified diet a special diet order is completed on the nursing station and sent to the dietary department where the orders are filed in a visible file according to nursing station. Each day a nourishment list is prepared from these diet orders. To request nourishment for a patient, the nurse or aide telephones the nourishment kitchen; this information is recorded in the nourishment kitchen on a consolidated requisition sheet. A system of identification assures that food items are requested for modified-diet patients; if otherwise, the items are charged to the patient's account. A dumb-waiter carries the food to the proper floor. In addition to nourishments, food brought into the hospital by a patient's relatives or friends is kept in the central nourishment kitchen rather than the floor kitchens and is sent to the floor as requested. This ensures that such food is reserved for the paticular patient and also regulates what the patient receives. Although the new nourishment procedure has been in use less than a year, it represents an estimated annual savings of more than $4000. In addition, nursing service time is saved since nursing personnel is not required to prepare any nourishments.

PERSONNEL JOURNAL

Vol. 35, June, 1956

* Handling grievances where there is no union. R. E. Sibson.—p. 56.

TOASTMASTER HOT-FOOD SERVERS ASSURE PIPING-HOT OVEN-FRESH MEALS!

At the Charleroi-Monessen (Charleroi, Pa.) Hospital complete meals are kept hot in mobile Toastmaster Hot-Food Servers while being transported to patients!

One of 6 Toastmaster Hot-Food Servers on its way to floors. Compact size and sturdy rubber casters make it easy for even the smallest woman to push. All electric kitchen also includes 4 Toastmaster Toasters which provide delicious, golden-brown toast daily.

Patients long remember the fast service and hot, appetizing food served at *this* modern hospital! As shown above, plates of hot food are assembled in the main kitchen, then placed in the reliable Toastmaster Hot-Food Servers. Each Hot-Food Server is then wheeled to the elevator and taken to its assigned floor where it is met by the cold food and tray carts. The completely assembled trays are then delivered to the patients. Meals arrive nourishing, hot, and oven-fresh in *both* taste *and* appearance!

Unique 6-sided air circulation, individual drawer moisture control and accurate thermostatic heat control maintain hot foods at the peak of perfection for hours, if necessary. The gleaming, stainless steel drawers and exterior provide the ultimate in food sanitation.

Ask your food service equipment dealer for more information about this hard-working plug-in appliance. Plan now to speed service, cut food costs, and maintain higher food quality with "Toastmaster"* Hot-Food Servers!

3D2-4C
4-drawer Mobile
$540.00†
holds 32 plates of hot food

AMERICA'S FINEST FOOD SERVICE EQUIPMENT

New **TOASTMASTER Hot-Food Server**

*"TOASTMASTER" is a registered trademark of McGraw Electric Company, Elgin, Illinois. ©1956.

†Prices slightly higher in Pacific Coast states.

Handling Grievances. Following are requirements for an effective grievance system. (a) A company must have definite and fair written personnel policies which are communicated to all employees and members of management. (b) Management at all levels must sincerely believe in the importance of solving grievances and must vigorously support the grievance system. (c) The system must expressly and formally handle all questions and complaints which may arise. New problems brought up should be a major source of suggested improvements to written company policy. (d) Employees must have complete confidence in the sincerity of management and the effectiveness of the grievance procedure. Thus, there must be no fear of reprisal for the employee will not otherwise use the system. The employee must understand the system—it must be formalized and reduced to writing. There must be a problem-solving atmosphere with grievances handled quickly. The employee should not be at any disadvantage in handling grievances because of lack of skill in presenting his case. (e) The grievance procedure should not undermine the effectiveness of line management, interfere with line management responsibilities in personnel matters, or align managers against each other. The system should be designed so that line supervisors handle appeals from the decision of line management. The primary function of the personnel department should be to assist and advise line management. (f) The system must recognize in a straight-forward manner that management is always the final arbiter of grievances in a non-union shop, unless managers wish to give away some of their rights to manage. This does not mean that the system cannot be successful. Rather, it points up to the need for management in the day-to-day administration of grievances to demonstrate to all employees that management is willing and able to work out satisfactory answers. (g) Grievances can provide management with the opportunity of determining the causes of employee unrest and serve as a means of fire prevention.

RESTAURANT MANAGEMENT

Vol. 78, May, 1956

* On the gas firing line. F. T. Hilliker.—p. 82.
* Fruit for thought. A. Easton.—p. 98.
* Where the customer "makes" the menu. W. W. Shields.—p. 101.

Vol. 78, June, 1956

* Kitchen layout tips. N. Kirikos.—p. 53.

Salads and desserts for summer. A. Easton.—p. 54.

Gas-Fired Cooking Equipment. Gas as fuel has the desirable characteristics of being applicable to all types and methods of cooking, whether it is baking, roasting, deep-fat frying, or range-top work. There is also the usage of the broiler and the griddle and the use of gas as a means of steam generation for kettles and steamers where direct steam is not available. There is also the conveyor-type gas toaster for large production and the heating of the coffee urn with thermostatic control. The author gives principles for planning and installing gas-fired cooking equipment, with layout examples from different types of operations.

Fruit for Thought. That "extra something" which accompanies a meat course may be the deciding factor when a customer makes his choice. For more interesting dishes, use fruits to add novelty: pork or duck served with orange sections and rice which has been cooked in orange juice; lamb loaf with mint meringue (recipe included); broiled grapefruit sections served with fish; chicken salad roll combined with a fruit salad, such as pear-halves with cottage cheese, and nuts, or macaroon crumbs, and fresh sweet cherries; grilled lamb and bacon patties with mint jelly; cinnamon-flavored French apple pan cake and crisp bacon; and sausage cakes with apple ring. Grapefruit juice with a ball of lime sherbert serves an an appetizer for luncheon or dinner. Grapefruit sections, crab flakes, and tomato cocktail sauce cost less than a seafood cocktail and supply the same zippy flavor. Apple gelatin salad with diced celery; pineapple slaw; spiced apple ring with cottage cheese; or peach-half in raspberry-flavored gelatin supply the needed tartness and crispness to accompany meat dishes. Fruit breads, such as banana nut bread, help to dress up a meal. Fruit desserts are many and delicious: try pear halves with sliced, crystallized ginger in sirup; oranges and grapes in rum; honey-baked pears with sliced fresh pineapple; diced canned pears with mint jelly cubes; or simply sliced bananas with oranges. Fruit and cake desserts are popular, such as black cherry and rum sauce on cottage pudding. Dairy products and fruits also make perfect dessert combinations. Calorie-conscious customers may settle for a fruit gelatin dessert, such as diced pears in ginger ale gelatin.

Customer Approval Makes the Menu. A large hotel chain utilizes a twenty-one-day rotating menu and takes the guess work out of kitchen preparation through a central food research department. Here recipes are tested and methods analyzed to better the product before the recipe is sent out to all hotels in the chain. There it is tried out for six months, and if it meets with approval, is made a basic recipe. In menu planning, much attention is given to the development of appealing salad and sandwich items because both can be served speedily with increased turnover a result. Emphasis is placed on interesting, nourishing, and attractive sandwich fillings and specialty breads. With all kinds of salads gaining in popularity, twenty different dressings offer added variety. Dessert sales are also on the increase because the chain is now concentrating on a limited line of success-proven, tested desserts. A special dessert menu which illustrates individual deserts in full color is featured. Typical are fresh lime meringue pie and coffee chiffon pie. Using items selected for the day's dessert menu, individual chefs may easily diversify the selection. The hotel management is currently making long range surveys to determine the benefits of centralized purchasing and distribution. Eventually vast amounts of food may be prepared in a central location and shipped to all outlets because it is felt that finished goods may be as economical to ship as raw products and will standardize quality. Seven standard basic recipes, a meat purchasing guide, fourteen pantry pointers, and a day's rotating menu illustrate this article.

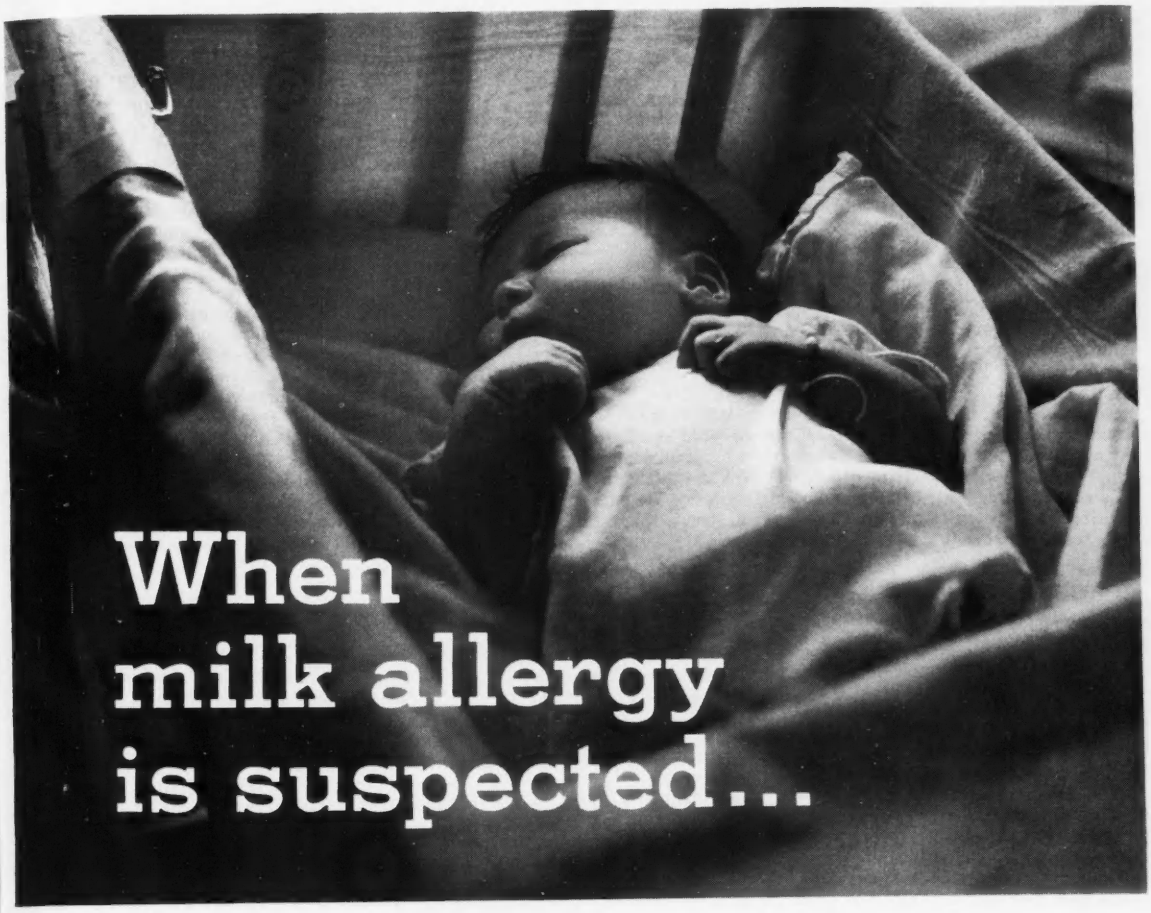
Kitchen Layout Tips. There are three reasons why layout in today's commercial kitchen is important. The first is traffic. In a kitchen where no thought has been given to traffic, the time element in fast output is defeated. The second factor is service. When equipment has been placed in the best location, kitchen personnel all work together, getting things done in easy, time-saving operations. The third factor is plumbing and electrical service and connections for them. Many restaurateurs do not make many changes in their kitchens because of the cost of bringing electricity and plumbing where they will be needed. The author shows two examples of how seemingly sensible layouts were vastly improved.

WHAT'S NEW IN HOME ECONOMICS

Vol. 20, June, 1956

* When students write recipes. F. L. Beinert.—p. 40.

Writing Recipes. When a student is able to write up her own favorite recipe correctly it means that she has full comprehension of the methods and techniques necessary to combine ingredients properly to achieve a desired result. Following are points which students and 4-H Club members should use as a measuring stick when writing recipes: (a) *Title*—it should be attractive, be somewhat descriptive of the product, and be tempting enough to make the reader want to try it at once. (b) *Appearance*—the recipe should look readable, neat, and clear. (c) *Order*—the recipe should follow a logical order of work. (d) *Ingredients*—these should be listed in order of use. All ingredients, including salt, should be listed. Special preparation of ingredients should be detailed as ingredients are mentioned. Ingredients should be clearly described so as to be easily identified when purchased. (e) *Measurements*—all ingredient measurements and all utensil sizes should be stated in terms of standard equipment. Amounts of ingredients should be in easily measured quantities and in level measurements. Unusual fractions are best avoided. Size of baking pan in inches; casserole, or cooking utensil by volume; and shape of pan should be given. (f) *Directions*—correct terms and such descriptive phrases as are necessary should be used to describe food preparation processes. Baking temperatures and approximate length of cooking or baking time should be given, with a few minutes' range to compensate for differences in equipment. (g) *Suggestions*—when possible, successful, unusual, or particularly attractive garnishes or serving suggestions should be given.



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A RELIABLE

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Desirable diagnostic method: When milk allergy is suspected, completely replace milk feedings with Gerber's Meat Base Formula, for 48 to 96 hours. Diagnosis would be confirmed by symptomatic improvement.

Approximates milk values: Gerber's Meat Base Formula provides practical equivalency with evaporated milk in complete proteins, carbohydrates, fats and minerals. Well-tolerated by infants*, fewer gastric upsets.

Nutritionally advantageous: Complete meat proteins, biologically more efficient than those found in vegetable-base preparations*, are provided by Gerber's Meat Base Formula.

Indicated for these symptoms: It is suggested for those infants whose symptoms may be eczema, pylorospasm, colic, diarrhea, constipation, respiratory difficulties, anorexia and other manifestations of milk allergy. Available through druggists. 14 fl. oz. 60¢.

Babies are our business . . . our only business!

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BABY FOODS
FREMONT, MICHIGAN

4 CEREALS • OVER 70 STRAINED AND JUNIOR FOODS, INCLUDING MEATS

**Rowe, Albert, Jr. and Rowe, Albert H.; Cal. Med. 81:279 (Oct.) 1954.*

Annual Meeting Glimmers

Milwaukee—October 9–12, 1956

MEMBERS PARTICIPATE

Some of the conferences held during the Annual Meeting are rated high by A.D.A. members, since they provide the opportunity for the discussion of common problems and for the exchange of ideas which often contribute toward the solution of on-the-job "sticklers."

Ten informal periods are planned for early Wednesday afternoon and six for late Thursday. Topics to be treated are those which will not be covered in the major sessions but which merit consideration.

Early morning conferences, held Tuesday through Friday, will be devoted to subjects related to the areas of the four sections. Each day, two will be concerned with diet therapy; two, with administration; one, with community nutrition; and one with education. Leaders for the conferences have been selected on the basis of their work in the respective areas and their activities in section projects. Those who are definitely scheduled are:

Frances P. Kelley, VA Center, Milwaukee—"Cost and Nutritional Accounting"

Byrdine Tuthill, University Hospital, University of Missouri—"Labor Time in the Dietary Department"

Maj. Mary Lipscomb, Brooke Army Medical Center, Fort Sam Houston—"Work Simplification"

Elmira E. Blecha, VA Hospital, Houston; Alice E. Heuberger, Mount Sinai Hospital, Chicago; and Arlene Payne, University of Kansas Medical Center—"Diet Therapy Problems"

Lorraine Weng, National Dairy Council, Chicago—"Handbook of Diet Therapy"

Julia Ann Barney, Baylor University Hospital, Dallas, and Elizabeth McCune, University of Kansas Medical Center—"Problems of Weight Control"

Virginia E. Pinney, St. Luke's Hospital, Chicago—"Cycle Menus for Hospitals"

Dr. Beatrice Donaldson, University of Wisconsin—"Food Administration"

MAJOR SESSIONS

Alexander Marble, M.D., who is associated with the Joslin Clinic, Boston, and who is the husband of former A.D.A. President, Beulah Becker Marble, will speak on the management of the child with diabetes. He will describe his work with the children at the Joslin Camps.

One of Tuesday night's speakers will be Dr. E. Neige Todhunter, who will have just returned from Rome where she will have addressed a session of the 2nd International Congress of Dietetics. Dr. Todhunter will discuss the present status of the profession.

The session on "Continuing Education of the Dietitian and Nutritionist" will introduce Charles F. Code, M.D., of the Mayo Clinic, Rochester. His topic will be "Research Experience as a Part of Graduate Education."

Dr. Martha F. Trulson will share in the maternal and child health session. Mary McCann will appear on the session devoted to degenerative diseases and will present a review of dietary surveys conducted in the United States from 1890 to the present time. Both speakers are on the faculty of the Department of Nutrition, Harvard University School of Public Health.

LEARNING BY VISITING

If you are the acquisitive type insofar as knowledge of a city is concerned, you will gain much from the tours which are being planned for you.

The following excursions represent but a few of those which are tucked up the sleeve of the Trips Committee:

Milwaukee Vocational School Institute of Technology, where a cook's course may be observed. It is a two-year course in restaurant and hotel cookery for high school graduates.

Columbia Hospital's effective use of central tray service. The capacity is 260 beds.

Milwaukee County Asylum, one of the seven units of the Milwaukee County Institutions. The latter maintains a food service building which houses completely the storage and preparation areas needed to feed 2700 patients as well as employed personnel. The building is equipped with a straight-line flow of food service, partial Meal Pack installation, and a Radar range.

National Dairy Products, which claims to have the most modern dairy in the United States.

Mount Sinai Hospital, a 300-bed institution, which features the only all-electric hospital kitchen in the city.

The Home Economics Department of the *John Oster Manufacturing Co.*, which features recipe development, and the *O. R. Pieper Company*, wholesale food purveyors who specialize in spices and coffee.

School lunch programs of the *Custer High School*, which has new facilities, and the *55th Street Elementary School* which has enjoyed ten years of operation with federal cooperation.

SPONTANEOUS TRIPS

Driving only a short distance from Milwaukee, you can enjoy a variety of sites, including historic Wade House. Just 70 mi. north of Milwaukee, it is 6 mi. west of Plymouth, the cheese center of the state. Wade House was a stage coach inn, built in 1850–51 to serve those who took the 40-mi. westward trip on the plank road to Fond du Lac. One of the few restored inns in the U. S., it is furnished in the 1850 period, as is the accompanying blacksmith shop known as Butternut House. It is so named after the timber cut on its site and used in its construction.

The birthplace of the Republican party is preserved at Ripon about 65 mi. north of Milwaukee. The Little White School House, where in 1854 the party was formed, is open daily to visitors.

Any one visiting Madison should also stop at nearby Mt. Horeb, and tour Little Norway, the village which has all the charm and characteristics of the settlement built by the immigrants from Nissedahl. It is set in the "Valley of the Elves" and includes an outdoor museum in its presentation of old Norway.

Spring Green is also in the Madison area. It is the address of Taliesin, the home of Frank Lloyd Wright.

Closer to Milwaukee, just 20 mi. north at Cedarburg, the last remaining covered bridge in the state is located. It is in daily use, providing a crossing over one of the branches of Cedar Creek, which was and in some cases still is the source of power for mills in the area.

A SHOW WORTH SEEING

Selectivity, spiced with entertaining variety, tersely describes the nature of the 280 booths of exhibits.

The *Dispensator Division, W. H. Frick, Inc.*, will show mobile dispensers for handling clean dishes, cups, and glasses transported in racks.

For refreshment, milk shakes made with Meritene will be served visitors by *The Dietene Company*.

Jarvis & Jarvis will display its food service equipment. Its catalog will also be available at the display.

Samples of AerVoid Live Oxygen Cleanser will be presented at the *Vacuum Can Company* booth.

Portable bins, baker's tables, and hot food tables are just a few of the products which the *Southern Equipment Company* plans to show.

They'll be yours for the taking—the booklets on foods and recipes sponsored by the *National Association of Margarine Manufacturers*.

Along with the "Electro-Fill" Water Station, *T & S Brass & Bronze Works, Inc.*, will feature its pre-rinse equipment and specialty faucets. Specialty faucets will include pedal valves and steam table fixtures.

The *Cream of Wheat Corporation* invites you to see its new exhibit and to receive copies of publications and vitamin food charts.

Diamond Crystal Sugar Packets will be in the spotlight when they are displayed with Diamond Crystal's salt and pepper packets.

Grandma's Unsulphured Molasses is going to distribute its book of tested recipes. Registration for copies of the new set of *Quantity Cookery Recipes* will be taken at their booth.

Toastmaster has announced a Powermatic Toaster with no levers to press. You will be able to examine it at the exhibit where the De Luxe Hot-Food Server will also be shown.

IMPORTANT . . . MAIL YOUR APPLICATION PROMPTLY

Application for Housing Accommodations

THE AMERICAN DIETETIC ASSOCIATION

Milwaukee, Wisc. • October 9–12, 1956

For your convenience in making hotel reservations for the coming meeting of THE AMERICAN DIETETIC ASSOCIATION October 9–12, 1956 in Milwaukee, hotels and their rates are listed below. Use the form at the bottom of this page, indicating your first, second and third choice. Because of the limited number of single rooms available, you will stand a much better chance of securing accommodations of your choice if your request calls for rooms to be occupied by two or more persons. All reservations must be cleared through the Housing Bureau. ALL REQUESTS FOR RESERVATIONS MUST GIVE DEFINITE DATE AND HOUR OF ARRIVAL AS WELL AS DEFINITE DATE AND APPROXIMATE HOUR OF DEPARTURE, ALSO NAMES AND ADDRESSES OF ALL PERSONS WHO WILL OCCUPY RESERVATIONS REQUESTED *MUST* BE INCLUDED.

Hotel	For one person	For two persons	
		Double	Twin Beds
AMBASSADOR	$5.00–$7.00	$8.00–10.00	$8.00–10.00
ASTOR	5.50– 7.50	8.00–10.50	9.50–12.00
KNICKERBOCKER	4.40 & up	6.60 & up	8.25 & up
MEDFORD	4.50– 5.25	6.25– 7.00	8.50–10.00
PFISTER	5.00– 9.00	7.50–10.00	8.00–12.00
PLANKINTON HOUSE	5.50–10.00	8.00–11.00	9.00–15.00
SCHROEDER	5.00– 8.00	8.00–12.00	10.00–16.00
WISCONSIN	4.50– 8.00	6.75–10.00	10.00–11.50

In the event that the hotel room rate structure is changed prior to the above convention these rates will be changed accordingly.

ALL RESERVATIONS MUST BE RECEIVED PRIOR TO: September 14, 1956

Miss Betty B. Wright
Room 517, 611 N. Broadway
Milwaukee 2, Wisc.

Please reserve the following accommodations for: THE AMERICAN DIETETIC ASSOCIATION Convention in Milwaukee, Wisc., October 9–12, 1956

Single Room_____ Double Bedded Room_____ Twin Bedded Room_____
Other Type of Room_____
Rate: From $_____ to $_____

First Choice Hotel_____
Second Choice Hotel_____
Third Choice Hotel_____

Arriving at Hotel (date)_____ hour_____ A. M._____ P. M. Leaving (date)_____ hour_____ A. M._____ P. M.

THE NAME OF EACH HOTEL GUEST MUST BE LISTED. Therefore, please include the names of *both* persons for *each* double room or twin bedded room requested. Names and addresses of all persons for whom you are requesting reservations and who will occupy the rooms asked for:

_____
_____
_____
_____

(Individual Requesting Reservations)

Name _____

Address_____

City and State_____

If the hotels of your choice are unable to accept your reservation the Hotels Convention Reservation Bureau will make as good a reservation as possible elsewhere provided all hotel rooms available have not already been taken.

News Notes

Borden Award Goes to Helen Gillum. On June 27 at the annual meeting of the American Home Economics Association in Washington, D. C. Dr. Helen L. Gillum, Associate Professor, University of California at Berkeley, was named the 1956 recipient of the Borden Award for fundamental research in the field of nutrition and experimental foods. The award was made in recognition of her part in organizing and carrying out a study of nutritional status of the aged. The committee, in making the selection, paid tribute to Dr. Gillum's eight years of concentrated, meticulous work in connection with the award-winning research. The results of the study, officially known as the Western Regional nutritional study entitled "Nutritional Status of the Aging," were published during 1955 in the *Journal of Nutrition*. Other research contributions by Dr. Gillum have been in the fields of lipid and cholesterol metabolism in undernourished and vitamin A-deficient rats and of ascorbic acid requirements of women.

New officers of the American Home Economics Association were also installed at this annual meeting. The new President, to serve for two years, will be Dr. Beulah V. Gillaspie, Dean, School of Home Economics, Purdue University, Lafayette, Indiana. She has served as President-Elect for the past year. Other new officers are: Vice-President, Dr. Elizabeth Dyar, Dean, School of Home Economics, Colorado A. & M. College, Ft. Collins; and Treasurer, Dr. Eleanor O. Barnes, Head, Department of Home Economics, University of Arkansas, Fayetteville.

Dietitian Honored. On June 9, at the meeting of the American Diabetes Association in Chicago, Alice Propst Hoover, a Cleveland dietitian, was the recipient of the first citation for outstanding achievement given by the Diabetes Association. Mrs. Hoover has been active in many community activities in Cleveland and has distinguished herself as co-founder and is currently Vice-President of the Diabetes Association of Greater Cleveland. She has also served on nine committees of that organization and in a number of other capacities, such as lecturer and radio and TV speaker. Presentation of the citation was made by Dr. Edwin W. Gates, Chairman, Assembly of the Delegates of the American Diabetes Association.

Mrs. Hoover was also accorded a second honor at this meeting in being elected Secretary of the Assembly of Delegates, an office usually held by a physician.

Scholarship to Honor Mrs. Coover. Gerber Products Company, Fremont, Michigan, has made a grant to Iowa State College for a $300 scholarship to be named in honor of the late Lillian Storms Coover. Mrs. Coover was for fifteen years Director of Nutrition for Gerber. She was a graduate of Iowa State College and later a chemistry instructor there. Connie Miller, a junior majoring in dietetics from Shenandoah, Iowa, has been named recipient of the scholarship.

Plentiful Foods MONTHLY LIST

Food expected to be in plentiful supply in August, according to the U.S.D.A., will be:

Protein foods

Beef
Chickens—broilers and fryers
Milk and other dairy products
Milk, dry
Turkeys

Fruits and Vegetables

Beets
Cabbage
Celery
Corn, sweet
Lemons, fresh and processed
Lima beans
Limes—fresh and processed
Pears, fresh Bartlett
Plums, fresh
Potatoes
Rice
Snap beans

Other foods

Ice cream
Peanut butter

Col. Perry Retires. As of June 30, Col. Miriam E. Perry, Chief, Medical Specialist Corps, U. S. Air Force, retired from the position which she has held since the founding of the Air Force's MSpC, and from active military duty.

Her duties have been assumed by Col. Audrey A. Underkofler who was previously Assistant Chief of the Corps.

Advertising Standards for Weight-Loss Plans. Recommended minimum standards for the advertising and selling of alleged weight-reducing products involving "plans" were recently released by The National Better Business Bureau, Inc., New York City. According to these standards, advertising should: (a) clearly and conspicuously indicate that the use of the product involves a "plan"; (b) not state or imply that use of the product alone, when used as part of a "plan," will cause weight reduction; (c) state that a restricted diet is part of the "plan"; (d) that the "plan" calling for adherence to low-calorie diets should not be represented as "easy," etc.; (e) not make appetite-curbing or hunger-appeasing claims for substances not generally recognized as possessing such values without proof from carefully controlled clinical studies; (f) avoid exaggerated and deceptive claims of specific weight losses in specific periods; and (g) be consistent with labeling and instructions for use accompanying the product.

Food and Drug Administration. In June, Congress appropriated an increase of $1 million for the Food and Drug Administration beginning July 1. The additional funds will enable the Administration to hire 131 additional scientific and other personnel and to purchase new equipment. Of the new personnel, it is anticipated that fifty-one will be in the scientific or technical category and about forty-six will be hired as inspectors. The remainder will be clerical workers. Most of the field additions will be chemists, while those in Washington will also include pharmacologists, physicians, bacteriologists, microscopists, and biologic chemists.

In the food field, additional attention is expected to be given to fresh and frozen poultry, frozen citrus fruits, and various prepared frozen foods. Search for methods of analysis of new chemical additives and residues in food will also be given top priority.

World Health Organization. The IX World Health Assembly convened in Geneva, Switzerland on May 8, under the presidency of Professor Jacques Parisot. Three new countries were admitted to full membership—Morocco, Tunisia, and the Sudan—and Associate membership was granted to the Gold Coast, the Federation of Nigeria, and Sierra Leone. This brings total membership of the World Health Organization to eighty-eight countries. A resolution was also passed to facilitate the resumption by "inactive" members of their right and obligations in the WHO and the settlement of their arrears in contributions. This will make it possible for nine countries which became inactive members in 1949 and 1950 to again be active in WHO activities. They are: U.S.S.R., Ukraine, Byelorussia, Bulgaria, Roumania, Albania, Czechoslovakia, Hungary, and Poland.

Six countries—Canada, India, Italy, Mexico, Syria, and the United Kingdom—were elected to designate persons to serve on the WHO's eighteen-member Executive Board for the next three years. The new members will replace members from the following countries, whose terms expire at the end of 1956: Austria, Costa Rica, Indonesia, Iraq, Switzerland, and the U. S.

In his report to the Assembly, Dr. M. G. Candau, WHO Director General, stated that in Europe and North America WHO in 1955 was increasingly concerned with such problems as occupational health, cardiovascular diseases, cancer, rheumatism, and geriatrics. In other regions of the world which contain nearly 80 per cent of the world's population, control and ultimate eradication of communicable diseases remain a high priority problem, the most vital and urgent problem being the need to destroy malaria-carrying mosquitoes before they develop resistance to insecticides. During 1955, more than 500 health projects were assisted by WHO in 108 countries

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Introducing
THE PAN-O-RAMA SPECTACULAR

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Baking Sheet

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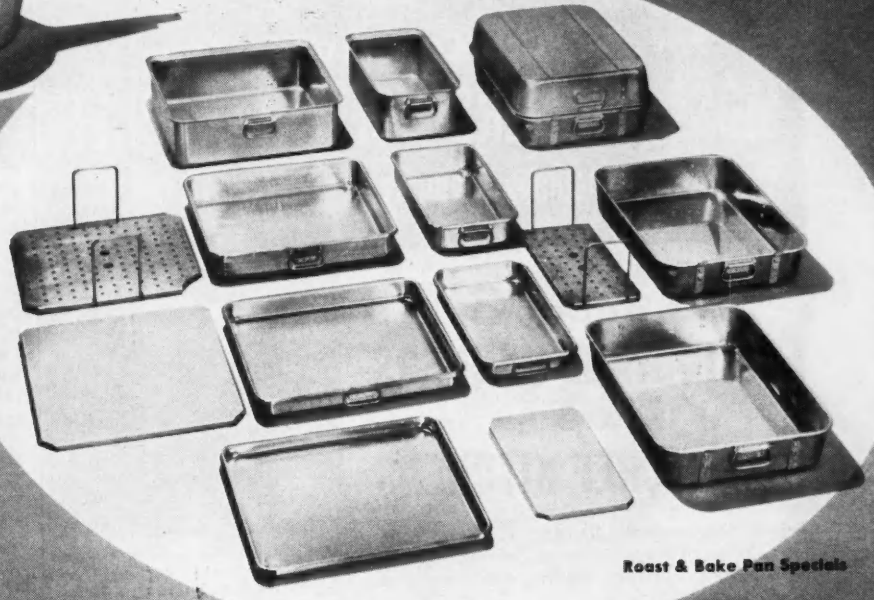
better baking surface



Roast & Bake Pan Specials

Aug. 1 to Sept. 30 *Special Prices* on these top quality Aluminum Utensils

Cat.No.	Description	Sale Price
STANDARD WEIGHT SPECIALS		
[illegible]	2¼ Gal. Stock Pot	$ 7.45
[illegible]	Cover to fit	2.50
[illegible]	4 Gal. Stock Pot	11.50
[illegible]	Cover to fit	2.95
[illegible]	6 Gal. Stock Pot	14.75
[illegible]	Cover to fit	3.75
[illegible]	7½ Gal. Stock Pot	17.65
[illegible]	Cover to fit	3.95
[illegible]	10 Gal. Stock Pot	19.95
[illegible]	Cover to fit	4.25
[illegible]	1½ Qt. Sauce Pan	2.95
[illegible]C	Cover to fit	1.10
[illegible]	2¾ Qt. Sauce Pan	3.50
[illegible]C	Cover to fit	1.40
[illegible]	3¾ Qt. Sauce Pan	4.10
[illegible]C	Cover to fit	1.50
[illegible]	4½ Qt. Sauce Pan	4.75
[illegible]C	Cover to fit	1.85
4345½	5½ Qt. Sauce Pan	4.95
4345½C	Cover to fit	1.95
4347	7 Qt. Sauce Pan	6.35
4347C	Cover to fit	2.15
4348½	8½ Qt. Sauce Pan	6.90
4348½C	Cover to fit	2.25
4350	10 Qt. Sauce Pan	7.95
4350C	Cover to fit	2.85
4611	11 Qt. Colander	9.85
4616	16 Qt. Colander	11.75
HEAVY DUTY SPECIALS		
4251	20 Qt. Stock Pot	526.95
4191	Cover to fit	3.50
4254	40 Qt. Stock Pot	41.50
4194	Cover to fit	4.25
4151	12 Qt. Sauce Pot	21.00
4191	Cover to fit	3.50
4152	14 Qt. Sauce Pot	23.50
4192	Cover to fit	3.75
4153	20 Qt. Sauce Pot	29.50
4193	Cover to fit	3.95
4154	26 Qt. Sauce Pot	34.50
4194	Cover to fit	4.25
ROAST & BAKE PAN SPECIALS		
4422	"Twin Oven" Bake Pan, 2¼" deep	$ 5.95
4423	"Twin Oven" Roast Pan, 3½" deep	6.95
4426	"Twin Oven" Roast Pan, 6½" deep	12.35
4426R	Rack for 4426	7.50
4424	Cover for 4422, 4423	3.95
4431	"Full Oven" Bake Sheet, 1½" deep	6.25
4432	"Full Oven" Roast Pan, 2¼" deep	9.65
4433	"Full Oven" Roast Pan, 3½" deep	10.35
4436	"Full Oven" Roast Pan, 6½" deep	16.95
4436R	Rack for 4436	10.95
4430	Cover for 4432, 4433	6.35
4483	Std. Roast Pan, 16" x 22" x 4½"	19.95
4483½	Lugged Pan for closed roasting	22.95
5300-T	Texturite Bake Sheet, 17-¾" x 25-¾" x 1"	5.80
A-5300-T	(Same with Alumilite Finish)	6.65

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and territories. In the mass campaigns against yaws and other treponematoses, by the end of 1955, 50 million people had been examined and 15 million treated, with the cost falling from 75 cents per treatment to 10 cents. In the field of tuberculosis, BCG campaigns continued, during which some 26 million persons were tested and 10 million vaccinated. Pilot studies to test the success of home treatment with new drugs for tuberculosis were also begun.

Dr. Candau also reported that more than 5000 awards have been made under the WHO fellowship program.

Inhibitors for Cheese Allowed. In June, the Food and Drug Administration announced an amendment of the federal cheese standards to allow the use of three preservatives to prevent molding or sliced and cut varieties of packaged cheese. The mold inhibitors which will be allowed are: calcium and sodium proprionate and sorbic acid. These materials are characterized by FDA scientists as "harmless food additives." The proprionates have been used for a number of years to inhibit molding of sliced bread. Both the proprionates and sorbic acid have been used experimentally in packaged cheese for several years and have been found safe and effective.

The chemicals are used only in varieties of cheese which are sold in the form of packaged cuts and slices, for it is in the cutting and packaging that tiny mold spores may be picked up from the air, later to grow within the packages. In practice, the propionates are used only in pasteurized cheese products, being added directly to the melted cheese, which is later cut and sliced and packaged. In the case of cuts or slices of natural cheese, it is impractical to add such a material to the cheese itself. Therefore, sorbic acid is used to treat wrappers so that small amounts of it come in contact with the outer surface of the cheese.

Both types of mold inhibitors are declared on package labels.

Government Publications. "Essentials of an Adequate Diet" is the title of a preliminary version of a new U.S.D.A. booklet released June 26 at the annual meeting of the American Home Economics Association in Washington. This new booklet details "A New Daily Food Plan" being sponsored by the Household Economics Research Branch, Agricultural Research Service, U.S.D.A. A "point" system with four food groups is proposed for use in selecting a good diet. The four groups are: milk, meat, vegetable-fruit, and cereal-bread. Although the foods in each group are much alike in food value, they vary in the amount of nutrients provided. Therefore, so that specific foods can be compared as sources of a key nutrient (such as protein), they have been given point values. For examples, 2 oz. cooked lean meat, fish, or poultry score 10 points for protein; one egg, 4 points. At least 20 points daily from the meat (protein) group are recommended. Thus a day's meals might include one egg (4 points), 2 oz. beef (10 points), and ½ cup baked beans (6 points). Although only a limited number of copies of this preliminary edition are available, the booklet in revised format will be published and generally available this fall. The preliminary edition carries the number ARS-62-4.

A consumer survey has been issued by the Market Development Branch, U.S.D.A., Marketing Research Report No. 116, entitled *Homemaker Preferences for Pies and Canned and Frozen Cherries . . . in Dallas, Detroit, Kansas City.* This booklet reports work by Daniel B. Levine which indicated that pie baking is still widely practiced in the home, with the most popular pie being apple. The average housewife in the three test cities baked pies fairly frequently, with 10 per cent baking four pies once or more a week and 20 per cent between two and three times a month. More than half had baked at least one cherry pie in the past year, using canned red sour cherries more frequently than all other cherry products. Only about 19 per cent of Dallas homemakers knew about frozen cherries, but in Detroit the percentage was 51, and in Kansas City, 64. Copies of this report are priced at 40 cents each from the Government Printing Office, Washington 25, D. C.

Findings in another survey by the U.S.D.A.'s Agricultural Marketing Service have also been published in a report titled *Consumer Purchases of Fruits and Juices by Family Characteristics—Apr.-Sept. 1955.* Primarily a tabular report, the findings are summarized according to the various fruits considered: oranges

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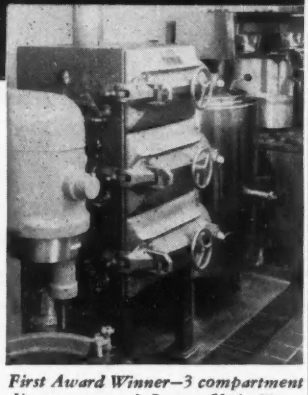

First Award Winner—3 compartment direct-connected Steam-Chef—Town and Country Restaurant, Chicago.

Again, results of the *"Institutions"* Food Service Contest prove that Steam-Chef and Steamcraft steamers are the leading steam cookers.

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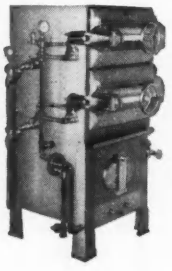
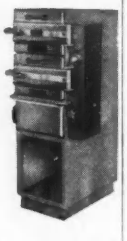


2 compartment, self-generating Steam-Chef.



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and orange juice; grapefruit and grapefruit juice; lemons and lemon products; frozen juices and ades; and canned juices. During the six-month survey, household consumers bought the equivalent of slightly more than 16 oranges per person, compared with 18 in 1953. Slightly higher purchases of Florida oranges than in 1953 are reported, but there was lower buying of California-Arizona oranges. Use of fresh grapefruit was well above the volume reported for 1953, and purchases of fresh lemons were slightly above those of two years earlier. Use of frozen concentrated orange juice was about one and one-third times as great as in 1953 and almost four times as large as the corresponding period in 1950, but purchases of canned orange juice were down about 10 cases per 1000 persons compared with 1953. Larger purchases of pineapple, prune, and grapefruit juice were reported, but these were offset by smaller sales of orange, tomato, and grape juice. Data are given by region, size of community, family income, family size, occupation of family head, education of family head, age of housewife, and presence of children in the household. Copies of the report are obtainable from the U.S.D.A.'s Agricultural Marketing Service, Washington 25, D. C.

A three-page offset reprint on "How to Cook Frozen Fish without Prethawing. Part 1. Determination of Optimum Internal Temperature for Baken Frozen Halibut Steaks" by Kathryn L. Osterhaug and Marian M. MacFarlane is available from the Fish and Wildlife Service, U. S. Department of Interior. An investigation, reported here, indicated that frozen halibut steaks, cooked without prethawing were most palatable when the internal temperature was either between 145° to 150°F. or 155° to 160°F. There was more general agreement among tasters in the range of 155° to 160°F.

Lighting Information. Many of the considerations involved in using lighting to best advantage are detailed in a report prepared by the Application Engineering Large Lamp Department, General Electric Co. in cooperation with the National Restaurant Association. Titled "Lighting Your Restaurant" (Technical Bulletin No. 300), this booklet is concerned with kitchen area lighting, dining area lighting, bar lighting, rest room lighting, sign and front lighting, and the effect of light on color and vice versa. One section on "lighting concepts," which deals with such subjects as levels of illumination; fluorescent and incandescent lamps; and daytime reflections is especially informative, as is the page describing popular fluorescent and incandescent lamps. A lighting maintenance check list is also presented.

Interns Graduate. At the Stanford University Hospitals, nine dietetic interns completed their year's work this summer. At a dinner in their honor, diplomas were presented by W. P. Geigenmuller, Superintendent, and A.D.A. pins were presented by Helen H. Anderson, Director of Dietetics. The graduates are: Carol Atchison, Mt. St. Mary's College, Los Angeles; Mary Baker, Simmons College; Marilyn Brady, Cornell University; Ladella Crombie, Oregon State College; Nan Greenshields, Michigan State University; Marilyn Hackethal, Loretto Heights College, Loretto, Colorado; Sally Ingraham, University of Washington; Louise Mullen, Washington State College; and Eileen Neff, Beaver College, Jenkentown, Pennsylvania.

Nutrition Work in India. The JOURNAL office has received a copy of the 1954–55 Annual Report of the Nutrition Research Laboratories, Coonoor, South India. In it, studies on vitamins, proteins, fats, the rice diet and fertility are reported, as well as clinical and field investigations. Of special interest appear to be the studies on the maintenance requirements of proteins in young Indian adults, and investigations of the treatment of kwashiorkor with vegetable protein diets and of the role of maternal malnutrition in kwashiorkor.

Cooking Frozen Chicken. In cooking frozen chicken, prior thawing is preferable, according to Dr. Faith Fenton, New York State (Cornell) Experiment Station. Dr. Fenton pointed out that some frozen chicken for stewing may go right into the water. However, cut-up broiler or fryer chicken generally needs thawing to separate the pieces, unless they are wrapped separately. In

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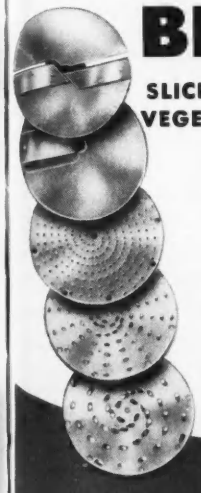

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frying, Dr. Fenton reports that it is difficult to get a brown crust on pieces that are not defrosted, and thawing is needed for chicken to be dipped in egg and crumbs before frying.

Also, chicken and other poultry thawed by dry heat before cooking will cook more uniformly and with less fuel than that which is started in the hard-frozen state. If poultry is roasted unthawed, the outside may be overdone and dry by the time the inside meat is done. It is also easier and often essential to have birds thawed in order to stuff and truss them, and the stuffing is more certain to be thoroughly heated when the bird is done.

Bread Buying by Homemakers. More than 95 per cent of the homemakers in Rockford, Illinois purchase white bread; about half buy whole wheat and half rye bread. Slightly over a third buy French or Vienna Bread, and slightly less than a third use raisin bread. Only 20 per cent use any other kind of loaf bread.

Bread is served at all meals in most homes, but in about a fourth, it is not eaten at all meals by all members of the family. More men than women eat bread at meals. Of those who don't eat bread, most are usually over twenty years of age, although a considerable percentage of children under twelve do not eat bread at each meal. More homemakers serve bread at breakfast, usually as toast, than at lunch and dinner. About half include bread in packed lunches (in sandwiches) and about half serve bread in between-meal lunches. These figures were gathered in a marketing survey conducted by the U.S.D.A.

A report of this study, "Consumer Preferences for White Breads of Different Formulas," Marketing Research Report No. 118, may be obtained from the Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

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News of State Associations

Colorado Dietetic Association. Colorado Springs was the setting of the annual spring meeting of the Colorado Dietetic Association on May 12. Special guests of the convention were college home economics students and dietetic interns at Colorado State Hospital, Pueblo, and Colorado General Hospital, Denver.

Principal speaker of the morning session was Dr. Lendal E. Kotschevar, Head, Department of Home Economics, Montana State University, Missoula, whose topic was "Making Good Work Easy." In the afternoon, the group was addressed by Dr. Robert Zimmerman, Colorado Springs, whose talk on "The Pendulum Swings" dealt with the newer trends in therapeutic diets, particularly as they relate to diabetes, obesity, and coronary disease.

Michigan Dietetic Association. This year the Michigan Dietetic Association is awarding two scholarships for dietetic internships. The Association scholarships of $120 goes to Juno-Ann Krohn, graduate of Michigan State University. The second, a $200 scholarship from the T. V. DuBois Foundation, will go to Joyce Norton, Western Michigan College.

The purchase of fourteen reference book units for all nursing stations at Butterworth Hospital, Grand Rapids, is the goal of the newly formed Mary Riste Guild, named to honor the superior work of the Chief Dietitian at Butterworth.

Nebraska Dietetic Association The ninth annual joint convention of the Nebraska Dietetic and Home Economics Associations was held April 13 and 14 in Lincoln. Theme of the meeting was "Public Relations—It's Up to You." Featured speakers included: Prof. Paul D. Ragwell, Michigan State University; Clifford M. Hardin, Chancellor University of Nebraska; and Ruth Davis Hill, Nebraska Home Economics Alumnae.

New York State Dietetic Association. A scholarship fund has been established by the New York State Dietetic Association, with plans to offer a $200 scholarship annually to a graduate of a college in the state who has been accepted in an A.D.A.-approved internship or to a person wishing to do graduate work. The fund was started at the spring meeting of the Association through contributions from individual members. A sum sufficient to offer a scholarship this

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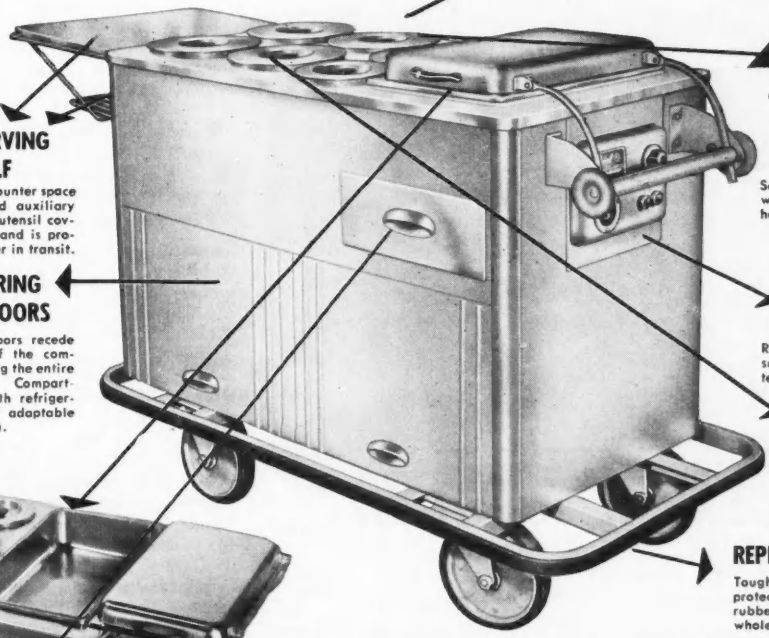

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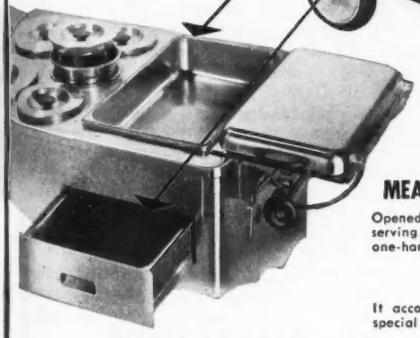
REPLACEABLE BUMPER GUARD

Tough aluminum bumper assembly fully protects body of conveyor. Clincher type rubber bumper guard easily replaced, in whole or part.



MEAT TRAY COVER, SERVING SHELF COMBINATION

Opened horizontally, this seamless cover of stainless steel provides extra serving space. The heavy stainless steel arm mechanism permits easy one-hand operation.

ELECTRICALLY HEATED DRAWER

It accommodates an extra full-size meat tray or fractional size pans for special diets. It may also be used for hot breads. Opens with safety stop.

***Shown above is Ideal Food Conveyor Model 1431, capacity 60 to 120 meals. Other models available with capacities from 20 to 500 meals.**

Ideal hospital equipment, made only by Swartzbaugh, is specially designed—inside and outside—to fit your need for maximum efficiency, fingertip convenience and lasting utility. That's why Ideal equipment items—food conveyors, tray conveyors, sterilizers and therapeutic equipment—are found in leading hospitals everywhere.

Write for FREE full-line catalog

Ideal HOSPITAL EQUIPMENT *Found in Foremost Hospitals*

HIA Hospital Industries Association

Made only by the

SWARTZBAUGH MANUFACTURING COMPANY

MURFREESBORO, TENN.

year plus enough to start next year's award was collected.

New York dietitians have been active, through their local associations, in public relations and career guidance activities this year. Projects have been classified according to five different categories: public relations in action; publicity—written; publicity—visual; publicity—audio; and other activities.

North Carolina Dietetic Association. June 13 to 15 were the dates of the fourth annual Hospital Food Service Institute held at the North Carolina State College, Raleigh. Sponsors were the North Carolina Dietetic and Hospital Associations and the State Board of Health. The program, planned for food service managers and/or supervisors in small hospitals of 20 to 100 beds, included:

"The Sanitarian's Visit—What It Means"—Howard S. Gailey, Alamance County Health Department, Burlington
"How Can I Save Time?"—Birshall Poole, Dietitian, North Carolina Memorial Hospital, Chapel Hill
"How to Determine the Quality of Fresh Fruits and Vegetables"—Dr. George S. Abshier, North Carolina State College
"How to Select Meat Cuts"—John Christian, Ph.D., North Carolina State College
"Variety in Meat Preparation"—Ann B. Eyl, Chief Dietitian, VA Hospital, Fayetteville
"The Dangers of Accidental Chemical Poisoning"—Vann Parker, M.D., Duke University Poison Control Center, Durham
"What Is Your Safety Rating?"—Louise Harlow Baity, Dietitian, Cerebral Palsy Hospital, Durham
"Supervisor and Employee Training"—Gertrude A. McDonald, Chief Dietitian, VA Hospital, Durham
Discussion groups on:
"You, The Patient, and the Modified Diet"
"How to Arrange an Attractive Tray"
"How to Sell Vegetables and Fruits"
"Hidden Food Costs"

Twelve North Carolina dietitians participated in the program as speakers or resource people for the group discussions. In addition, two appeared on a local radio program in connection with publicity for the Institute.

Wisconsin Dietetic Association. On April 27 and 28, the annual convention of the Wisconsin Dietetic Association was held in Madison. The program included the following talks:

"Vitamin B_{12} Absorption"—Robert Schilling, M.D., University of Wisconsin Medical School
"Are Chemical Bactericides Effective?" Charles V. Seastone, M.D., Chairman, Department of Medical Biology, University of Wisconsin Medical School
"Nutritional Accounting" — Grace Stumpf, School of Home Economics, University of Wisconsin
"Food Service in Our Welfare Institutions"—a panel discussion
"A Message to Dietitians"—Thomas J. Lucas, Jr., Civil Defense Coordinator, Wisconsin Department of Public Welfare
"Labor Hours in the Dietary Department"—Byrdine Tuthill, School of Home Economics, University of Wisconsin

A tea honored Dr. Helen T. Parsons, Professor of Foods and Nutrition, School of Home Economics, University of Wisconsin, who is retiring this year. She was also the honored banquet speaker talking on "Reminiscences from My Years of Research."

Announcement has been made of the recipients of two $200 scholarships by the Association to college graduates majoring in foods and nutrition. They are: Ruth Theine, Milwaukee Downer College, who will enter the internship in dietetics at Ohio State University Hospital; and Joanne Smarslik, of the University of Wisconsin, who will intern at the University of Colorado Hospital.

Association Activities

Diabetes Teaching Materials. The Joint Committee of the American Diabetes Association, The American Dietetic Association, and the Chronic Disease Program, U. S. Public Health Service has developed three additional *Meal Plans* as a part of the diabetes

THE CARDINAL GLENNON MEMORIAL HOSPITAL FOR CHILDREN, St. Louis, Mo.
Architects—Maguolo & Quick

CUSTOM-BILT BY SOUTHERN

Food service equipment designed, engineered, fabricated and installed in any type operation, expertly fitted to available space. You can depend on thorough cooperation by your Southern Dealer, from initial analysis of your food service problems through complete installation and reliable maintenance for the years to come. Get expert help with your next kitchen equipment problem or layout—call your "Custom-Bilt by Southern" dealer, or write Southern Equipment Company, 4550 Gustine Ave., St. Louis 16, Missouri.

SOUTHERN
EQUIPMENT COMPANY

"CUSTOM-BILT BY SOUTHERN" DEALERS: **ALABAMA,** BIRMINGHAM—Vulcan Equip. & Supply Co.; MOBILE—Mobile Fixture Co. **ARKANSAS,** LITTLE ROCK—Krebs Bros. Supply Co. **COLORADO,** DENVER—Arnholz Coffee & Supply Co. **FLORIDA,** DAYTONA BEACH—Ward Morgan Co.; JACKSONVILLE—W. H. Morgan Co.; MIAMI—J. Conkle Inc.; ORLANDO—Turner-Haack Co.; TAMPA—Food Service Equip. & Engr. Corp. **ILLINOIS,** PEORIA—Hertzel's Equip. Co. **INDIANA,** EVANSVILLE—Weber Equip. Co.; INDIANAPOLIS, MARION—National China & Equip. Corp. **IOWA,** DES MOINES—Bolton & Hay. **KANSAS,** WICHITA—Arnholz Coffee & Supply Co. **KENTUCKY,** LEXINGTON—Heilbron-Matthews Co. **LOUISIANA,** NEW ORLEANS—J. S. Waterman Co., Inc.; SHREVEPORT—Buckelew Hdwe. Co. **MICHIGAN,** BAY CITY—Kirchman Bros. Co.; DETROIT—A. J. Marshall Co. **MINNESOTA,** MINNEAPOLIS—Aslesen Co. **MISSOURI,** KANSAS CITY—Greenwood's Inc. **MONTANA,** BILLINGS—Northwest Fixture Co. **NEBRASKA,** OMAHA—Buller Fixture Co. **NORTH CAROLINA,** ASHEVILLE—Asheville Showcase & Fixture Co. **NORTH DAKOTA,** FARGO—Fargo Food & Equip. Co. **OHIO,** CINCINNATI—H. Lauber & Co.; CLEVELAND—S. S. Kemp Co.; COLUMBUS—General Hotel Supply; TOLEDO—Rowland Equip. Co.; YOUNGSTOWN—W. C. Zabel Co. **OKLAHOMA,** TULSA—Goodner Van Co. **PENNSYLVANIA,** ERIE—A. F. Schultz Co. **SOUTH CAROLINA,** GREENVILLE—Food Equipment Co. **TENNESSEE,** CHATTANOOGA—Mountain City Stove Co.; KNOXVILLE—E. Carleton Scruggs; MEMPHIS—House-Bond Co.; NASHVILLE—McKay-Cameron Co. **TEXAS,** AMARILLO—Arnholz Coffee & Supply Co.; CORPUS CHRISTI—Southwestern Hotel Supply, Inc.; EL PASO—El Paso Hotel Supply Co.; SAN ANTONIO—Southwestern Hotel Supply, Inc. **UTAH,** SALT LAKE CITY—Restaurant & Store Equip. Co. **VIRGINIA,** RICHMOND—Ezekiel & Weilman Co. **WEST VIRGINIA,** CLARKSBURG—Parson-Souders Co. **WISCONSIN,** MILWAUKEE—S. J. Casper Co.

to help you solve
many diet problems

Sustagen

therapeutic food for complete nourishment

A dilemma frequently confronting the dietitian arises from the fact that the nutritional needs of sick or injured patients are increased at a time when appetite and the ability to eat are often impaired. Further complicating the problem of diet in illness are physiologic disturbances which require the restriction of certain valuable nutrients—sodium, cholesterol, purines, etc.—common in many foods.

Type of Diet	Amount of Sustagen	Calories	Protein Gm.	Carbohydrate Gm.	Fat Gm.	Comment
Low purine diet	Sustagen, 530 Gm.	2050	124	350	19	no purine nitrogen; 42 mg. uric acid
Low cholesterol diet	Sustagen, 530 Gm.	2050	124	350	19	150 mg. cholesterol
High protein, low fat diet	Sustagen, 580 Gm.	2250	137	385	20	contains all amino acids in well balanced amounts
Liquid diet	Sustagen, 540 Gm.	2100	127	360	19	viscosity suitable for tube feeding
Bland diet (Peptic ulcer)	Sustagen, 570 Gm.	2200	134	377	20	buffering capacity of Sustagen is effective and prolonged
Liberalized low sodium diet*	Sustagen, 465 Gm.	1800	110	310	16	980 mg. sodium

*Note that the sodium content of Sustagen limits its use when dietary restriction of sodium must be severe.

Sustagen® is the only therapeutic food which contains all known dietary essentials, requiring only the addition of water. In addition to nutritional qualities Sustagen was designed to meet many physical and biochemical requirements of therapeutic nutrition. Thus Sustagen may be used, by mouth or by tube, as the only source of food or to fortify the therapeutic diet.

Sustagen is supplied in powder form in 1 pound, 2½ pound and 5 pound cans. One pound provides 1750 calories, including 105 Gm. protein.

MEAD SYMBOL OF SERVICE IN MEDICINE

MEAD JOHNSON & COMPANY · EVANSVILLE 21, INDIANA, U.S.A.

Here's Proof
FMC JET DISPOSER
CUTS KITCHEN COSTS

"... Elimination of garbage disposal and collection services"
"Sewage problems eliminated day we installed FMC JET Disposer."
"Sanitary conditions have been greatly improved."
"An easy and sure way of food waste disposal."
"... highly recommend JET Disposer to every restaurant owner."
"... elimination of garbage cans ... more parking space."
"Used 16 hours a day, 7 days a week."
"It has never required service of any kind."
"Saving will pay for JET in short time."
"Silver losses reduced to an absolute minimum."
fmc JET DISPOSER

Actual letters Sent Upon Request.

Write for Bulletin KE-103—
"How to Cut Kitchen Costs"

Automation equipment for kitchens

Kitchen Equipment Department
FOOD MACHINERY AND CHEMICAL CORPORATION
General Sales Offices:
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103 E. Maple Street, Hoopeston, Illinois

teaching materials. These are known as *Meal Plans 7, 8,* and *9* and have higher caloric values than the previous meal plans. *Meal Plan 7* is intended primarily for use in juvenile diabetes, as are *Meal Plans 5* and *6*, already in use.

Meal Plan 7 has 3500 calories, 370 gm. carbohydrate, 140 gm. protein, and 165 gm. fat.
Meal Plan 8 provides 2600 calories, 250 gm. carbohydrate, 115 gm. protein, and 130 gm. fat.
Meal Plan 9 has 3000 calories with 300 gm. carbohydrate, 120 gm. protein, and 145 gm. fat.

The meal plans are now available from The American Dietetic Association at a cost of 5 cents each or $2 per 100.

Also available is a revised "Diabetic Diet Card for Physicians," which incorporates the new *Meal Plans 7, 8,* and *9*, as well as directions for the selection of a diet prescription. A table of body weights is also included. This card costs 5 cents a copy, or $2 per 100.

The following additional modifications are being developed for future release: a sodium-restricted diabetic diet and a bland, low-fiber diabetic diet.

Assistance to Libraries Abroad. Contributions to the A.D.A. Education Section Project, "Professional Cooperation with Nutrition Workers and Libraries in Other Countries," have enabled the Committee to send books and subscriptions to the JOURNAL to twenty persons in other countries thus far this year. Many letters of appreciation have been received, and further needs have been expressed. Although a considerable sum has been available from last year's contributions to the project, this money has now been spent along with much of that received this year. Helen Ger Olson, Chairman of the project, and her committee are hoping that other state and local dietetic associations will "earmark" funds for this project so that these much needed materials may continue to be supplied.

By-laws Committee. The By-Laws Committee of the House of Delegates met at Headquarters Office on June 22, Genevieve Anthony, Chairman, presiding. Plans for the revision of the model constitution for state dietetic associations were completed. A copy of the revised model will be sent each delegate this summer.

Obituaries

Lottie L. Hagood. The A.D.A. office has been notified of the death of Lottie L. Hagood, dietitian at York Central Hospital, York, Nebraska. Miss Hagood had been a member of the Association since 1930.

Dana Pellegren. Word has reached the Association office of the death of Dana Pellegren, formerly on the staff of Providence Hospital, Portland, Oregon. She had been an A.D.A. member since 1954.

Why risk your investment in costly produce by using an ordinary salad dressing?

FOR ONLY A FRACTION OF A CENT MORE PER SERVING YOU CAN USE RICH, FULL-BODIED

Kraft Mayonnaise

You use choice lettuce in your salads, so why risk spoiling the salad *and* customer dissatisfaction by using just any mayonnaise? For only a fraction of a cent more per serving you can dress your salads with full-bodied Kraft Mayonnaise!

And the quality of Kraft Mayonnaise justifies paying this slight difference, because here's true mayonnaise at its finest—luxuriously rich, made from costly salad oil, eggs, fragrant vinegar and seasoning. *Nothing else!* Packed in 1-gallon jars and 4-gallon tins.

The Nation's Taste is Your Best Buying Guide

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Pick the

Right

CUSTOM

Tenderizer

for the Job

Just as a single skillet cannot cook all types and cuts of meat properly, one kind of tenderizer cannot do a really good tenderizing job on all meats.

Obviously, thicker cuts require deeper, faster penetration. Tougher cuts require accelerated action. Thin cuts need a more delicately balanced action.

And, Custom provides a tenderizer for every cooking need.

Here they are . . . ready and able to make all your meat dishes a source of exciting new taste!

For specific uses and greatly detailed information, consult your Custom Jobber. He will be glad to show you how tenderizers can improve your recipes and increase your profit.

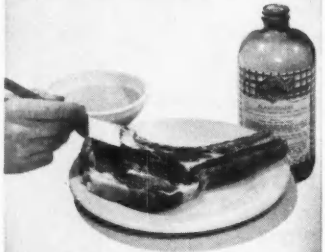
Custom FOOD PRODUCTS, Inc.

701 N. Western Ave., Dept.

Chicago 12, Ill.

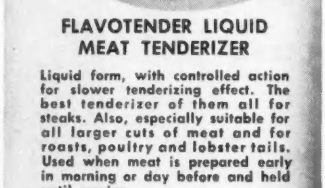
INSTANT TENDERIZER

In liquid form, with extremely high potency. Does a thorough job in just a minute or two. Especially for steaks of average thickness and other thin cuts. Ideal when meat is cooked to order, quickly.



FLAVOTENDER LIQUID MEAT TENDERIZER

Liquid form, with controlled action for slower tenderizing effect. The best tenderizer of them all for steaks. Also, especially suitable for all larger cuts of meat and for roasts, poultry and lobster tails. Used when meat is prepared early in morning or day before and held until serving.



FLAVOTENDER POWDER MEAT TENDERIZER

Granular form, very convenient and easy to handle. Has minimum of salt, and is made with monosodium glutamate to bring out full flavor of meat. Controlled action takes 15 to 20 minutes.

STEAK SEASONING

Liquid form, but with controlled action. Seasoned only enough to enhance rich meat flavor. Adds no flavor of its own. Widely used in restaurants.

News of Products and Services

Hotpoint Co. has now come out with an all-stainless steel, double grease-trough companion model to the "Rocket 12" griddle. Designated the "Rocket 12-X," the new griddle, has twin thermostats, each controlling half of the 642 sq. in. grid area. Rapid recovery is featured in this equipment as in the Rocket 12. The new griddle's rated capacity is over 700, ¼-lb. hamburgers an hour. Its grid size is 36 by 18 in.

National Biscuit Company's "Waverly Wafers" are now available in individual service packets of two rectangular-shaped crackers costing less than 1 cent per serving. "Waverly Wafers" are all-purpose crackers and may be served with soups, salads, appetizers, or other dishes.

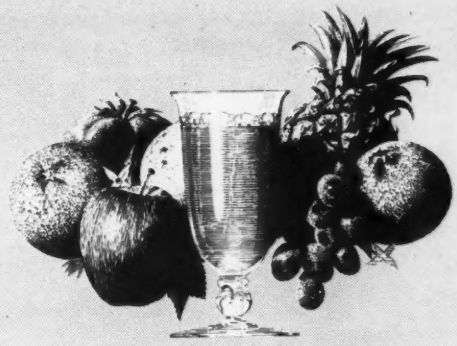
"Water Impurities and Brewed Coffee Flavor" is the title of a booklet released by *The Coffee Brewing Institute* which reviews the results of a two-year study at the Massachusetts Institute of Technology. The general conclusion reached is that inorganic minerals in water do not affect the taste of brewed coffee. Two other booklets just released are bibliographies which survey the world literature on coffee in the years 1953 and 1954. They list all of the important literature published in those years.

"Dripcut Servers" are now being manufactured in vitrified china by *Dispensers, Inc.* They are available in "sunset yellow," coral, "park blue," "seafoam blue," and brown to match and complement dishes and chinaware.

Downyflake Baking Mixes (Division of Doughnut Corporation of America) is marketing eleven new specialty products, including toppings, fillings, icings, and an unusual white sauce mix. By using white sauce mix, white sauce may be prepared simply by adding boiling water, mixing gradually, or stirring rapidly with a spoon, egg beater, wire whip, or slotted spoon. The sauce is then placed immediately in a double boiler or steam table to be kept warm until ready for use. The white sauce mix is packed in 5-lb. bags, six to a case.

Downyflake is also introducing a doughnut-making device designed for small doughnut operation. The new cutter is simple to use: fill the hopper with batter, set the dial to size of doughnut desired, depress the handle and release. Uniform doughnuts are the result. The device makes doughnuts in six sizes, and there are attachments to make stick and ball doughnuts. Improved features are: (a) cutting handles have been extended so the cutter can be used with either one or both hands; (b) the hopper has been increased in size to hold approximately 7½ lb. batter (5-lb. bag of Downyflake dry mix); (c) the hopper is shaped to give the dough a more even flow of gravity feed, resulting in a more uniform cutting; (d) due to a change in design, the cutter is less top-heavy than formerly and can be stored without the possibility of tipping over. It is made of heavy aluminum with

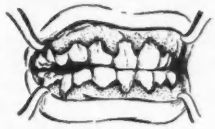
WHY SHOULD THE VITAMIN C CONTENT OF FRUIT AND VEGETABLE JUICES BE STANDARDIZED?



Because nutrition reports disclose that—

- **Vitamin C deficiencies exist throughout the country***
- **Scurvy has not disappeared from the United States***

Proof of deficiencies among adults and children. You should know these facts!* Diet surveys from Maine and Vermont, New York, Illinois, New Mexico, Oregon, West Virginia, and Texas show a definite pattern of inadequate vitamin C intake. These studies covered grade school and high school children, college men and women.



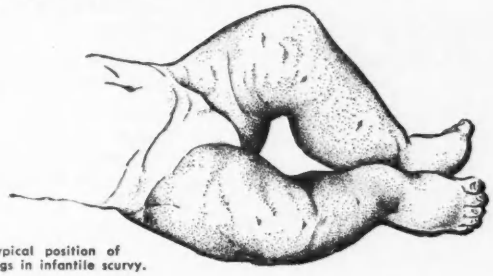
Spongy, swollen gums symptomatic of scurvy.

From these studies* of dietary habits and physical conditions there is considerable proof that many of the children and adults covered by survey have actual, physical symptoms of vitamin C deficiency.

Infantile scurvy. Scurvy* occurs, even today, among infants who are artificially fed. Fortunately the disease may be cured by the administration of vitamin C. How much more sensible it is to prevent it by supplying these bottle-fed infants with the daily allowance of 30 milligrams of vitamin C as recommended by the Food and Nutrition Board of the National Research Council for children under one year of age.

Symptoms of infantile scurvy are fretfulness and fear of being touched.

These bottle-fed infants, unless receiving a pediatric prescription containing vitamin C, are largely dependent on supplemental ascorbic acid which they receive from fruit or vegetable juices. Unless fortified with vitamin C many of the processed juices may not supply these babies with adequate quantities of this essential element.



Typical position of legs in infantile scurvy.

What can be done? Because of the increasing evidence that American diets are deficient in vitamin C, leading nutrition experts believe that processed fruit and vegetable juices, on which the public is so reliant for its supply of this necessary vitamin, should contain the "Vital Ingredient."

The Vital Ingredient of any processed fruit or vegetable juice is a *dependable* and *adequate* supply of vitamin C. You can give your juice this ingredient by *standardizing its vitamin C content*. The processing is simple and the new low cost of ascorbic acid makes juice standardization more attractive than ever.

With ascorbic acid available *by the tons* at extremely modest cost fruit and vegetable juices can have a standardized vitamin C content for the better protection of the nation's health and well-being.

*Statements are based on documented reports. References on request.

Illustrations after photographs in The Vitamins in Medicine by Bicknell and Prescott, Third Edition, published by Grune & Stratton, Inc., New York.

ROCHE Pure, crystalline VITAMIN C
(Ascorbic acid, U. S. P.)

VITAMIN DIVISION • **HOFFMANN-LA ROCHE INC.** • NUTLEY 10, N. J.

In Canada: Hoffmann-La Roche Ltd., 286 St. Paul Street, West; Montreal, Quebec

Delicious Foods to Add Welcome Variety to

SODIUM RESTICTED DIETS

DIETETIC CHEESE—A rich yellow full-flavored cheddar-type cheese. Sodium value only 9.5 mgs. in 100 grams or 3 mgs. in the average serving of 1 oz. Available in ½ and 1 lb. sizes.

CELLU UNSALTED BREAD—A milk-free white wheat bread baked in 10 oz. cans. Sealed to keep it fresh. Natural sodium content only 4 mgs. in 100 grams or two ½" slices.

CELLU PUREE OF TOMATO—Packed without sugar, salt or other seasonings. Full bodied, of excellent flavor and consistency. Versatile for soups, sauces, spaghetti, etc. Only 4 mgs. in 100 grams.

CELLU® dietetic foods

SEND FOR FREE LITERATURE ON COMPLETE LINE OF SODIUM RESTRICTED DIETARY FOODS

CHICAGO DIETETIC SUPPLY HOUSE, INC.
Dept. 12G, Chicago 12, Illinois

PIONEERS IN DIETARY FOODS SINCE 1921

For samples, without obligation:
THE H. R. NICHOLSON CO.
Kenshaw & Oakleaf Aves.
Baltimore 15, Maryland

You'd Think Oranges Grew on Trees!

Imagine paying only 1.57¢ per 4-ounce serving of delicious Orange Or only 1.48¢, grapefruit. Modern laboratory-control brings you the true Orange & Grapefruit flavor that all America loves *plus* controlled nutrition (more than minimum daily adult Vitamin C requirement in every 4 ounce serving. *PLUS* a low price that eases the squeeze on your menu. No wonder leading hospitals, state institutions, colleges, etc. have switched to Bombay!

BOMBAY

California Valencia Orange and Grapefruit Bases

steel precision cutting attachment, is easy to operate, and can be cleaned in 2 min.

The *American Institute of Baking* has announced the appointment of Norine Condon as a member of its Consumer Service Department. Miss Condon has been a hospital dietitian in several Chicago-area hospitals and chief dietitian in a Phoenix, Arizona hospital, in addition to having experience in the business field. She will help to assemble material from original research sources for nutrition education publications of the Institute. She will also supply nutritional data for recipes issued by the Institute's test kitchen.

Several new items have been added to the *S. Gumpert Co., Inc.*, line of products. The first two are Gumpert's Low Sodium Chicken Soup Base and Beef Soup Base. Both are in granular form, packed in 3-oz. jars, enough to make 3 qt. finished chicken or beef broth. Two level teaspoons of either base, added to 1 c. boiling water, make one individual portion of bouillon. Each 6-oz. serving of the Chicken Soup Base contains: fat, 0.92 gm.; protein, 0.09 gm.; carbohydrate, 4.03 gm.; calories, 24.8; sodium, 4.5 mg. The Beef Soup Base will provide in a 6-oz. serving: fat, 1.04 gm.; protein, 0.31 gm.; carbohydrate, 3.55 gm.; calories, 24.8; and sodium 5.6 mg. The bases are packed twenty-four 3-oz. jars to a case.

A third new *Gumpert* product is a new Apple Flavor which has been added to the company's "Velvet Smooth" line of water ices and sherbet bases in jellied form. The new apple flavor is available in two quantities: in quart containers, enough to make 2½ gal. finished water ice or sherbet, and in 1-gal. containers, sufficient for 10 gal. finished product.

Gumpert has also developed a new Apple Punch flavor in powdered form for the restaurant and institution field. Cost per 6-oz. serving is less than 1¼ cents. The fruit flavor is packed in 16-oz. and 5-lb. tins.

Gumpert's Lemon Royale is an easy-to-make lemon pudding dessert or pie filling. A 5-lb. tin of Lemon Royale makes five, 9-in. pies at a total filling cost of $1.20, or 3½ cents per cut. A 3-oz. serving of Lemon Royale Pudding costs 4 cents.

The story of food processing is colorfully presented in *General Foods'* new film, "Harvest of Convenience—An Introduction to General Foods." The 16 mm. color film, which runs for 28 min. depicts how this company contributes to the job of feeding America. The camera takes the viewer to the tropics for scenes of harvesting coffee beans, to the Grand Banks where trawler fleets net tons of fish, and to the Philippines for coconut processing. There is a brief stop at Battle Creek, Michigan, for a picture story of a typical American product. Taste testing and development of new recipes and new products also are filmed. *General Foods* is making this film available upon request.

A new vegetable purée base has been developed by *Cramore Fruit Products* which may be used in soups, salads, gravies, hors d'oeuvres, and other food

"We can prove to ourselves the economy of Libbey Heat-Treated DATED Glassware"

HOT SHOPPES, INC.
5161 RIVER ROAD
WASHINGTON 16, D. C.

J. WILLARD MARRIOTT
PRESIDENT

Libbey Glass
Division of Owens-Illinois
Toledo 1, Ohio

Gentlemen:

Your Heat-Treated DATED Glassware has allowed us to check accurately the number of servings per tumbler in our Hot Shoppes restaurants all over the country. We have proved to ourselves the economy of Libbey Heat-Treated DATED Glassware in our restaurants, and are considering its use in our newest venture, the Marriott Motor Hotel. Scheduled to open this fall just outside Washington, D. C., it will be the world's largest motel.

A check of our restaurant operations all over the country revealed that only 27.5 per cent of the glasses now in use are at least a year old -- in other words, we are serving our patrons with practically new sparkling glasses.

The average tumbler use is 739 servings -- at an amazingly low cost of 8.8 cents per 1,000. Libbey Glassware provides the fine service we like to give our patrons.

Sincerely yours,

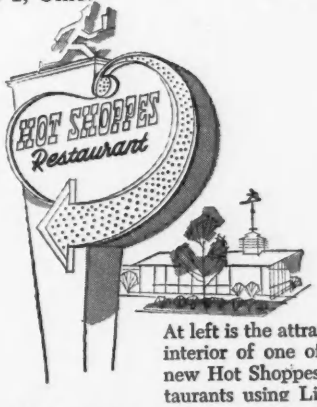
J. Willard Marriott

Mr. J. Willard Marriott
President of the
Hot Shoppes, Inc.

For seven years a code symbol on the bottom of every Libbey Heat-Treated glass has made it possible to trace this revolutionary ware in almost every type of use.

Mr. J. Willard Marriott, President of the Hot Shoppes, Inc., chain of Washington, D. C., and Past President of the National Restaurant Association, is convinced of the economy of Libbey Heat-Treated DATED Glassware . . . as are restaurant operators throughout the country. You can prove to *yourself* the economy of the world's first DATED Glassware . . . prove that Heat-Treating and the Libbey guarantee: "A new glass if the rim of a Libbey 'Safedge' ever chips" provide the finest glassware service at the lowest cost per serving.

Your Libbey Supply dealer has complete details. See him or write Libbey Glass, Division of Owens-Illinois, Toledo 1, Ohio.



At left is the attractive interior of one of the new Hot Shoppes restaurants using Libbey Heat-Treated DATED Glassware. To check your own glasses just look at the Heat-Treated mark on the bottom of each tumbler. Numbers indicate date of manufacture—left shows year and right shows quarter. Add up the number of servings to see the amazing economy of Libbey Heat-Treated DATED glasses.

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Author Harry Caleva served his apprenticeship under many well-known European chefs including Alfredo, famous Italian chef. Originator of the Formula Cooking System in leading hotels and restaurants, world traveler, author, inventor and connoisseur of fine cuisine, Caleva is the *one* American qualified to write this outstanding book on world favorite Italian recipes.

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The 100th anniversay of the lemon industry in California has been marked by the introduction by *Sunkist Growers* of trademarked Sunkist lemons, similar to the marked and familiar Sunkist oranges. Because of the delicate skins of lemons that are harmed by minor bruises or abrasions and their eliptical shape, the same machine used to mark oranges cannot be used for lemons. However, a lemon-stamping machine has now been developed, so that trademarked lemons will now greet grocery shoppers.

Sunkist Growers has also announced a new product—Quick Frozen Concentrate for Pink Lemonade. The new concentrate contains sugar sirup, pure lemon juice, lemon juice concentrate, and pure fruit juice for color. One can makes 1 qt. lemonade.

Royal Instant Cocoa is now available in individual packets from the Institutional Department of *Standard Brands Incorporated*. A laminated Snopaque glassine is used to protect the flavor.

A new line of stainless steel-copper cooking utensils claimed to provide perfect heat distribution throughout the utensil as well as extremely rugged, durable construction is available from *Legions Utensils Co.* The new group of cooking utensils has been designated the "Four-Ply" line. The utensils are made from a double-clad steel sheet consisting of 60 per cent mild steel core covered on both sides with 20 per cent stainless steel. An additional layer of copper is bonded to the bottoms of the utensils, providing four distinct layers of bonded metal. The mild steel core and the copper bottom are said to be the ideal combination for heat distribution over the entire cooking area. The stainless steel interiors are easy to clean, representing a reduction in labor time as well as the assurance of perfect sanitation. The utensils in the line are seamless, drawn from one piece of metal, thereby eliminating seams and corners.

A new meat chopper, Model 1275, has been announced by *Sanitary Scale Company*. Designed for a capacity of 1275 lb. per hour, the new machine features a large capacity, heavy duty pan 2¾ by 13 by 28 in. in dimensions. A ¾- H.P. motor is said to be the work formerly required of a 1-H.P. unit.

Economics Laboratory, Inc., has begun construction of a new, 85,000 sq. ft., one-story building in Chicago. Completion of the new structure is expected in January 1957.

Grocery Store Products Co. has issued a new recipe booklet, "Mushrooms in Your Menu," featuring dishes using BinB Mushrooms, Kitchen Bouquet, and Cream of Rice. Each double-page spread features foods for different purposes, running the gambit from "Smart Snacks and Relishes" to "Friday Fare" and "Varied Vegetables." Some of the recipes are: mushroom chutney, *coq au vin*, baked mushroom stuffed peppers, *arroz con pollo*, and vegetable chow mein.

Robertshaw-Fulton Controls Company has announced production of the "Unitrol 110"—a popular-priced automatic control for gas water heaters. The magnet assembly, filter cartridge, and valve assembly of the Model 110 are interchangeable with those of other Unitrols. All connections are straight down and parallel, and the temperature and gas cock dials can be read from both top and front. A red push button at the top permits quick resetting of the pilot. Other features are: large non-clog pilot gas passage ports, big capacity filter cartridge to prevent ports from clogging, powerful electromagnet, and improved "C" valve adjustment.

The "Meals-on-Wheels System" has a new member—a cold tray assembly table known as the "TA-100." According to the manufacturer, *Crimsco, Inc.*, this mobile table accommodates up to 100 trays, with accompanying accessories; in addition, it provides three shelves to house cold foods. The "TA-100" is designed to: reduce the handling of trays and tray items from dishwasher to tray assembly area, lower the investment in fixed kitchen equipment, and allow easier supervision of patient trays in the set-up stages.

Crimco also announces a "Meals-on-Wheels System" food delivery unit to insure patients' hot beverages "hot" and cold food "cold." A self-contained refrigeration system maintains constant cold temperature for cold food from the kitchen to the patient floor; a built-in hot beverage compartment carries two hot beverages, and a third container for cold beverages is available. Three styles of this unit serve from twenty to twenty-six patients. Spigots and beverage compartments are removable for easy cleaning.

A new and expanded, eighty-three-page catalogue, No. 66-D, has been released by *Wear-Ever* aluminum. Pocket-size, the catalogue lists and illustrates seven general lines of equipment manufactured by *The Aluminum Cooking Utensil Company, Inc.*, for institution and industrial use. Included are professional restaurant utensils, equipment for the food industries, steam-jacketed and gas-fired kettles and urns, clinical utensils and equipment, aluminum alloy furniture and smokers, professional cutlery, and gift cutlery.

Wear-Ever has also introduced a new "Texturite" baking sheet, which has a new baking surface said to allow even browning, to prevent excessive sticking, and to permit easy cleaning. The new baking sheet will be featured as a "Pan-O-Rama" spectacular during the company's special utensil sale during August and September.

A molding process which makes color banding of melamine dinnerware possible has been developed by the *Plastics Manufacturing Company*. This process is utilized in two new lines: "Regal," which is available in white with bands of burgundy, sage green, jonquil yellow, Dresden blue, sea green, ocean coral, or shell gray, and in tan with a band of sepia; and "Premiere," which is molded in turquoise, sherbert pink, shell gray, and jonquil yellow—each banded in white.